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JUN 19 2002

TECH CENTER 1600/2900

<110> McGill University
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<120> LOCI FOR IDIOPATHIC GENERALIZED EPILEPSY, MUTATIONS
THEREOF AND METHOD USING SAME TO ASSESS, DIAGNOSE,
PROGNOSE OR TREAT EPILEPSY

<130> GOUD:023

<150> 09/167,623

<151> 2000-11-24

<140> PCT/CA00/01404

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<140> 60/167,623

<141> 1999-11-26

<160> 408

<170> PatentIn Ver. 2.1

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 Tyr Gly Asp Ile Pro Pro Glu Met Val Ser Glu Pro Leu Glu Asp Leu

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dcdnkvnvgss	vkgdcgnsvg	vsysvvvnmy	avnsvatsas	ddmyvwkdda	tmksaaannk	1140
amdvmvgdhr	cdatkrvgsg	mdarmrmasn	skvsytttkr	kvsavrayrr	hkrtvkasty	1200
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<210> 5
<211> 850
<212> DNA
<213> Homo sapiens

<400> 5
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aggttgagga agaaatcata aatctggatt gtgagaaagt gtttaatat tagccactag 240
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aagtttattc attccagtta ttccttttga aaaagagtcc atggaaattc agtttgggca 660
gagcaggaag tccatttttg tatgtgtatt cagaccaact gtccccctcc tccctctcct 720
cctcttcttg tccccctccc cgcgcctccc tctctcaacc ttccatgaac tgaaatcagg 780
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<210> 6
<211> 483
<212> DNA
<213> Homo sapiens

<400> 6
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caggacctga cagcttcaac ttcttcacca gagaatctct tgcggctatt gaaagacgca 180
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cccaaagcaa atagtgactt ggaagctgga aagaaccttc catttattta tggagacatt 300
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gtgagtgttt tttttatcag gcatattttt gctgctaatt gcctactgca ttccttggac 420
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ttt 483

<210> 7
<211> 497
<212> DNA
<213> Homo sapiens

<400> 7
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agtttaagtg gtttatactt tcatacttct atgttgtgtt cctgtcttac agacttttat 180
agtattgaat aaagggaagg ccatcttccg gttcagtgcc acctctgccc tgtacatttt 240
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ttcaagtgat taatattaac tatttgtaca tgatctgtaa gcactttata gctaaatatc 360
aaattaagtt gggaaatgtc catattatat aggtttcatc actctcattt tgcattcttg 420
tcatattagc ctcatcttta aagttcatta atcacataga cattactgaa acatgtactc 480
tttaacattt tatatat 497

<210> 8
<211> 501
<212> DNA
<213> Homo sapiens

<400> 8
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tatccctgaa ttttggtctaa gctgcagttt gggcttttca atgttagctt tttgtaatat 180
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gattytgaaa ctgtgtctta atgtagtctt aaaataaaac tgaagagcat tttattaaag 420
tcattcctag acaaaattac gcagcaagag gacaatgctc attggccctc aggcctgctg 480
gcgtttatact gattatcact c 501

<210> 9
<211> 563
<212> DNA
<213> Homo sapiens

<400> 9
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aaaatccatc tgcttagttt tcttttttag tatttatcta ttccactgat ggagtataa 180
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cattacattt gcgtaagtgc ctttbytgaa actttaagag agaacatagt ttggttttcc 420
atcagtgtct atgcttttaa gaataggttt gctttacctg tagaatattt ttgtgtgatt 480
tatacattca aactctggat ttcaatttag cacaacaaag gtctaagtgg aatttcacta 540
tagcatgaag gctttgcagt agt 563

<210> 10
<211> 253
<212> DNA
<213> Homo sapiens

<400> 10
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agtcttgaga gctttgaaaa ctatttcggt aattccaggt aagaagtgat tagagtaaag 180
gataggctct ttgtacctac agctttttct ttgtgtcctg tttttgtgtt tgtgtgtgaa 240
ctcccgtta cag 253

<210> 11
<211> 340
<212> DNA
<213> Homo sapiens

<400> 11
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attccaggtg	agagcaaggt	tagataatga	gacggacca	tcatgtgatt	cagcatcctt	240
ctctgcttga	cattcagttt	tacagaaaaat	caggaatcat	aagactaggt	gttcaaagaa	300
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<210> 12
 <211> 409
 <212> DNA
 <213> Homo sapiens

<400> 12						
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tgagcgtatt	tgtcttaatt	gggctgcagc	tggtcatggg	caacctgagg	aataaatgta	180
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tgaattataa	tggtacactt	ataaatgaaa	ctgtctttga	gtttgactgg	aagtcataata	300
ttcaagattc	aagtaagaat	tattgttatg	tacatttcct	taaaaagtag	aattggattg	360
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<210> 13
 <211> 266
 <212> DNA
 <213> Homo sapiens

<400> 13						
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cgactttctt	ttttcaaaca	ggatatcatt	atttctgga	gggtttttta	gatgcactac	180
tatgtggaaa	tagctctgat	gcagggttaag	tcaatattgt	gtgcatctgt	gtatattgta	240
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<210> 14
 <211> 604
 <212> DNA
 <213> Homo sapiens

<400> 14						
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gaaatagatt	agttacttat	ttgtcaaact	tttattttga	aataccaaat	ctttctgact	180
aggcaatatt	atagcatagt	atcagagtaa	aaaggcagca	gaacgacttg	taatactttc	240
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ctaagtactc	aggacttctg	ggaaaatctt	tatcaactgg	tgagaactaa	agagccacac	420
tctccattta	agtaaaaagta	tacaagaaaa	ccaattgagt	tatgaaatta	aaaccggatg	480
ataatatagt	agaaagagca	gaacttgaca	cgagacttga	gttcctctat	cctattgatt	540
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tcaa						604

<210> 15
 <211> 378
 <212> DNA

<213> Homo sapiens

<400> 15

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acatgatatt ttttgtattg gtcattttct tgggctcatt ctacctaata aatttgatcc 180
tggctgtggt ggccatggcc tacgaggaac agaatcaggc caccttgga gaagcagaac 240
agaaagaggc cgaatttcag cagatgattg aacagcttaa aaagcaacag gaggcagctc 300
aggtaagctg ccctgctcat ggcactgacc tttatcgtct gatgtactat atgagagaag 360
tagtctagag cgtgtgat                                     378
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<210> 16

<211> 845

<212> DNA

<213> Homo sapiens

<400> 16

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cataataaat gttacatgg agcaaaactaa attatctcca aaagccttca ttaggtaga 180
agaaaaaaaa aatctcctct tatacttgca gagaatcttc tctgtgagat gatcttcagt 240
cagttcaata tattttttta aagccatgca aatacttcag ccctttcaaa gaaagataca 300
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agcctctaag ttgagttcca agagtgttaa ggaaagaaga aatcgaggga agaaaagaaa 480
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tgaggacagc atcaggaggw aaggttttcg ctctctcatt gaagggaacc ggttgacata 600
tgaaaagagg tactcctccc cacaccagg atggcactgc tgagtttact gatgcatggt 660
tgaaaattaa aacatgggag agagggggag atttagaaaa tggactcagg aatttttatc 720
aactgaatca accactgttg tggttatatt aaacccatcc ctcttcaca tagttatgca 780
aaaactttac tccacagata tgtaagtcta cagctcgggt tagttaagat aacaccaagt 840
tgaca                                             845
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<210> 17

<211> 965

<212> DNA

<213> Homo sapiens

<400> 17

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taatcccaag ggctagaaac tttcttttat caaggtaatt taatttaatg tgaatgcaca 180
taaaatgaga atgataatca aaaggaatga accatattct gttatgaatg ctgaaatctc 240
cttctacata atcttgcaaa atgaaatcac attcaaatgt ccatattaat atgactctat 300
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gagaacgact tcgcagatga tgagcacagc acctttgagg ataacgagag ccgtagagat 480
tccttgtttg tgccccgagc acacggagag agacgcaaca gcaacctgag tcagaccagt 540
aggtcatccc ggatgctggc agtggtttcca gcgaatggga agatgcacag cactgtggat 600
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cttctgccag aggtgataat agataagcca gctactgatg acaatgtaag gaagtytta 720
atagttcagg catggctggc tcactattgc tgcaccagcc agtgtgtcta cagaacggca 780
accttgagaa tgattcctgg ttggctcagc tgtgaatgca cctgcattct gtaatatctt 840
tgatagacta accaactaaa acttaaaacc ttagcagtcg cctgcacaaa cctgaatgca 900
tttacttatt aaaagtgtca aggattgatt agacacaata attactgcct ccagttggag 960
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gattt

965

<210> 18
<211> 641
<212> DNA
<213> Homo sapiens

<400> 18
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atgatacaat aagtcagaaa tatctgccat caccaattga atatgaaagt gcatgatgca 180
tgtgtttcat gaaattcact gtgtcaccat ttggttggtt gcttgtcata ttgctcaa 240
taattgttta atgcattagc attttttttt acagggaaca accactgaaa ctgaaatgag 300
aaagagaagg tcaagttctt tccacgtttc catggacttt ctagaagatc cttcccaaag 360
gcaacgagca atgagtatag ccagcattct aacaaatata gtagaagggt ggtaacaaat 420
tctattttcg tttcaattat tttcaccaaa cttatattgt ctcatattca acaaatatat 480
ttgtgagttg ggaatagtgc attctaataa aaagacagtc taattcaaga gctgttattt 540
cttatatcta ctcatagatt ctagaagcct taacaattta ttttaaaatg agtgatattg 600
ggactaagac tgttttccta actgtgtagc aactctttga a 641

<210> 19
<211> 818
<212> DNA
<213> Homo sapiens

<400> 19
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ataaccttgg gaggtttaga gtaaactgta atttttttta caagtacaaa aaaggggtgc 180
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<210> 20
<211> 645
<212> DNA
<213> Homo sapiens

<400> 20
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aactacaaat tgccatacaa atttaagtta gtaatagaat cattgtggga aaatagcata 180
agcattatgt tctaagagca aatcttatgt catgtatgtt attatctggt ggaattagat 240
taattttgtt ttgatcttag gttttcactg ggaatctttac agcagaaatg tttctgaaaa 300
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ttgtgacgct tagcctggta gaacttggac tcgccaatgt ggaagggtta tctgttctcc 420

gttcatttcg attggtaaaa aaaaaaaaaa aaggaaccaa attcaaaaac ctttctaaca 480
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<210> 21
 <211> 829
 <212> DNA
 <213> Homo sapiens

<400> 21
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 aacgttaaat atgctaataa agatcatcgg caattccgtg ggggctctgg gaaatttaac 180
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 aaaaacaaac tatgattatt ggtttaaaag tccattacct tggatatatt atcactttaa 660
 caacacagca atatabcagt gcccctgcat tttttatacc aaattctatt ttgtcagtca 720
 ctttatcaca ttttttatgt gaattacaat agagtatcat attgagatga gcctaaaagg 780
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<210> 22
 <211> 909
 <212> DNA
 <213> Homo sapiens

<400> 22
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 agaaatcatg tctttgtcca aggatgtgct attgagccag tcacaaattc agatcaccca 180
 tcttctaate actatgctgt ggtgtttcct tctcatcaag ttttagaact tagagttttt 240
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<210> 23
 <211> 516
 <212> DNA
 <213> Homo sapiens

<220>

<221> modified_base

<222> (403 - 516)

<223> N = A, C, G, or T

<400> 23

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aaattcatag taataatcct tcttggcagg caacttatta ccaaaattaa ggactttact 180
ttctatgtcc atctcactta cagaaactga atgaaagcag tagctcatca gaaggtagca 240
ctgtggacat cggcgcacct gtagaagaac agcccgtagt ggaacctgaa gaaactcttg 300
aaccggaagc ttgtttcact gaaggtaaag aaaagaatcc taatgttaat ctttcatttg 360
gagtgcagct tatttagctg ttggtcagct aanataaatc acatataata aaatngcact 420
ttgtaataga tataattcaa tcacctctaa tatnttgaca gacaaaaaaa cttaaagtct 480
agtgtcatgc tttgattata tctgcccaat atntgg 516
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<210> 24

<211> 640

<212> DNA

<213> Homo sapiens

<400> 24

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gacaaggaca ttgctaaagg atattatgga agcagagaca ctttatctac ttttatttca 180
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aagaaaaggt gatacagcac taatttttag aacactctaa tactgatgac ttattaatcc 420
tttgtttcat tgtcttagta tccaatgcat ttttaattat cccacctgtg atcttctata 480
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<211> 607

<212> DNA

<213> Homo sapiens

<400> 25

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<211> 336

<212> DNA
<213> Homo sapiens

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<212> DNA
<213> Homo sapiens

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<213> Homo sapiens

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<213> Homo sapiens

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<211> 393
<212> DNA
<213> Homo sapiens

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<211> 539
<212> DNA
<213> Homo sapiens

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<212> DNA

<213> Homo sapiens

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145 150 155 160
Thr Phe Thr Gly Ile Tyr Thr Phe Glu Ser Leu Ile Lys Ile Leu Ala
165 170 175
Arg Gly Phe Cys Leu Glu Asp Phe Thr Phe Leu Arg Asp Pro Trp Asn
180 185 190
Trp Leu Asp Phe Thr Val Ile Thr Phe Ala Tyr Val Thr Glu Phe Val
195 200 205
Asp Leu Gly Asn Val Ser Ala Leu Arg Thr Phe Arg Val Leu Arg Ala
210 215 220
Leu Lys Thr Ile Ser Val Ile Pro Gly Leu Lys Thr Ile Val Gly Ala
225 230 235 240
Leu Ile Gln Ser Val Lys Lys Leu Ser Asp Val Met Ile Leu Thr Val

245	250	255
Phe Cys Leu Ser Val Phe Ala Leu Ile Gly Leu Gln Leu Phe Met Gly		
260	265	270
Asn Leu Arg Asn Lys Cys Leu Gln Trp Pro Pro Asp Asn Ser Ser Phe		
275	280	285
Glu Ile Asn Ile Thr Ser Phe Phe Asn Asn Ser Leu Asp Gly Asn Gly		
290	295	300
Thr Thr Phe Asn Arg Thr Val Ser Ile Phe Asn Trp Asp Glu Tyr Ile		
305	310	315
Glu Asp Lys Ser His Phe Tyr Phe Leu Glu Gly Gln Asn Asp Ala Leu		
325	330	335
Leu Cys Gly Asn Ser Ser Asp Ala Gly Gln Cys Pro Glu Gly Tyr Ile		
340	345	350
Cys Val Lys Ala Gly Arg Asn Pro Asn Tyr Gly Tyr Thr Ser Phe Asp		
355	360	365
Thr Phe Ser Trp Ala Phe Leu Ser Leu Phe Arg Leu Met Thr Gln Asp		
370	375	380
Phe Trp Glu Asn Leu Tyr Gln Leu Thr Leu Arg Ala Ala Gly Lys Thr		
385	390	395
Tyr Met Ile Phe Phe Val Leu Val Ile Phe Leu Gly Ser Phe Tyr Leu		
405	410	415
Ile Asn Leu Ile Leu Ala Val Val Ala Met Ala Tyr Glu Glu Gln Asn		
420	425	430
Gln Ala Thr Leu Glu Glu Ala Glu Gln Lys Glu Ala Glu Phe Gln Gln		
435	440	445
Met Leu Glu Gln Leu Lys Lys Gln Gln Glu Glu Ala Gln Ala Ala Ala		
450	455	460
Ala Ala Ala Ser Ala Glu Ser Arg Asp Phe Ser Gly Ala Gly Gly Ile		
465	470	475
Gly Val Phe Ser Glu Ser Ser Ser Val Ala Ser Lys Leu Ser Ser Lys		
485	490	495
Ser Glu Lys Glu Leu Lys Asn Arg Arg Lys Lys Lys Lys Gln Lys Glu		
500	505	510
Gln Ser Gly Glu Glu Glu Lys Asn Asp Arg Val Leu Lys Ser Glu Ser		
515	520	525
Glu Asp Ser Ile Arg Arg Lys Gly Phe Arg Phe Ser Leu Glu Gly Ser		
530	535	540
Arg Leu Thr Tyr Glu Lys Arg Phe Ser Ser Pro His Gln Ser Leu Leu		

545 550 555 560
 Ser Ile Arg Gly Ser Leu Phe Ser Pro Arg Arg Asn Ser Arg Ala Ser
 565 570 575
 Leu Phe Ser Phe Arg Gly Arg Ala Lys Asp Ile Gly Ser Glu Asn Asp
 580 585 590
 Phe Ala Asp Asp Glu His Ser Thr Phe Glu Asp Asn Asp Ser Arg Arg
 595 600 605
 Asp Ser Leu Phe Val Pro His Arg His Gly Glu Arg Arg His Ser Asn
 610 615 620
 Val Ser Gln Ala Ser Arg Ala Ser Arg Val Leu Pro Ile Leu Pro Met
 625 630 635 640
 Asn Gly Lys Met His Ser Ala Val Asp Cys Asn Gly Val Val Ser Leu
 645 650 655
 Val Gly Gly Pro Ser Thr Leu Thr Ser Ala Gly Gln Leu Leu Pro Glu
 660 665 670
 Gly Thr Thr Thr Glu Thr Glu Ile Arg Lys Arg Arg Ser Ser Ser Tyr
 675 680 685
 His Val Ser Met Asp Leu Leu Glu Asp Pro Thr Ser Arg Gln Arg Ala
 690 695 700
 Met Ser Ile Ala Ser Ile Leu Thr Asn Thr Met Glu Glu Leu Glu Glu
 705 710 715 720
 Ser Arg Gln Lys Cys Pro Pro Cys Trp Tyr Lys Phe Ala Asn Met Cys
 725 730 735
 Leu Ile Trp Asp Cys Cys Lys Pro Trp Leu Lys Val Lys His Leu Val
 740 745 750
 Asn Leu Val Val Met Asp Pro Phe Val Asp Leu Ala Ile Thr Ile Cys
 755 760 765
 Ile Val Leu Asn Thr Leu Phe Met Ala Met Glu His Tyr Pro Met Thr
 770 775 780
 Glu Gln Phe Ser Ser Val Leu Ser Val Gly Asn Leu Val Phe Thr Gly
 785 790 795 800
 Ile Phe Thr Ala Glu Met Phe Leu Lys Ile Ile Ala Met Asp Pro Tyr
 805 810 815
 Tyr Tyr Phe Gln Glu Gly Trp Asn Ile Phe Asp Gly Phe Ile Val Ser
 820 825 830
 Leu Ser Leu Met Glu Leu Gly Leu Ala Asn Val Glu Gly Leu Ser Val
 835 840 845
 Leu Arg Ser Phe Arg Leu Leu Arg Val Phe Lys Leu Ala Lys Ser Trp

850	855	860
Pro Thr Leu Asn Met Leu Ile Lys Ile Ile Gly Asn Ser Val Gly Ala		
865	870	875 880
Leu Gly Asn Leu Thr Leu Val Leu Ala Ile Ile Val Phe Ile Phe Ala		
	885	890 895
Val Val Gly Met Gln Leu Phe Gly Lys Ser Tyr Lys Glu Cys Val Cys		
	900	905 910
Lys Ile Ser Asn Asp Cys Glu Leu Pro Arg Trp His Met His Asp Phe		
	915	920 925
Phe His Ser Phe Leu Ile Val Phe Arg Val Leu Cys Gly Glu Trp Ile		
	930	935 940
Glu Thr Met Trp Asp Cys Met Glu Val Ala Gly Gln Thr Met Cys Leu		
	945	950 955 960
Thr Val Phe Met Met Val Met Val Ile Gly Asn Leu Val Val Leu Asn		
	965	970 975
Leu Phe Leu Ala Leu Leu Leu Ser Ser Phe Ser Ser Asp Asn Leu Ala		
	980	985 990
Ala Thr Asp Asp Asp Asn Glu Met Asn Asn Leu Gln Ile Ala Val Gly		
	995	1000 1005
Arg Met Gln Lys Gly Ile Asp Phe Val Lys Arg Lys Ile Arg Glu Phe		
	1010	1015 1020
Ile Gln Lys Ala Phe Val Arg Lys Gln Lys Ala Leu Asp Glu Ile Lys		
	1025	1030 1035 1040
Pro Leu Glu Asp Leu Asn Asn Lys Lys Asp Ser Cys Ile Ser Asn His		
	1045	1050 1055
Thr Thr Ile Glu Ile Gly Lys Asp Leu Asn Tyr Leu Lys Asp Gly Asn		
	1060	1065 1070
Gly Thr Thr Ser Gly Ile Gly Ser Ser Val Glu Lys Tyr Val Val Asp		
	1075	1080 1085
Glu Ser Asp Tyr Met Ser Phe Ile Asn Asn Pro Ser Leu Thr Val Thr		
	1090	1095 1100
Val Pro Ile Ala Val Gly Glu Ser Asp Phe Glu Asn Leu Asn Thr Glu		
	1105	1110 1115 1120
Glu Phe Ser Ser Glu Ser Asp Met Glu Glu Ser Lys Glu Lys Leu Asn		
	1125	1130 1135
Ala Thr Ser Ser Ser Glu Gly Ser Thr Val Asp Ile Gly Ala Pro Ala		
	1140	1145 1150
Glu Gly Glu Gln Pro Glu Val Glu Pro Glu Glu Ser Leu Glu Pro Glu		

1155	1160	1165
Ala Cys Phe Thr Glu Asp Cys Val Arg Lys Phe Lys Cys Cys Gln Ile		
1170	1175	1180
Ser Ile Glu Glu Gly Lys Gly Lys Leu Trp Trp Asn Leu Arg Lys Thr		
1185	1190	1195 1200
Cys Tyr Lys Ile Val Glu His Asn Trp Phe Glu Thr Phe Ile Val Phe		
1205	1210	1215
Met Ile Leu Leu Ser Ser Gly Ala Leu Ala Phe Glu Asp Ile Tyr Ile		
1220	1225	1230
Glu Gln Arg Lys Thr Ile Lys Thr Met Leu Glu Tyr Ala Asp Lys Val		
1235	1240	1245
Phe Thr Tyr Ile Phe Ile Leu Glu Met Leu Leu Lys Trp Val Ala Tyr		
1250	1255	1260
Gly Phe Gln Val Tyr Phe Thr Asn Ala Trp Cys Trp Leu Asp Phe Leu		
1265	1270	1275 1280
Ile Val Asp Val Ser Leu Val Ser Leu Thr Ala Asn Ala Leu Gly Tyr		
1285	1290	1295
Ser Glu Leu Gly Ala Ile Lys Ser Leu Arg Thr Leu Arg Ala Leu Arg		
1300	1305	1310
Pro Leu Arg Ala Leu Ser Arg Phe Glu Gly Met Arg Ala Val Val Asn		
1315	1320	1325
Ala Leu Leu Gly Ala Ile Pro Ser Ile Met Asn Val Leu Leu Val Cys		
1330	1335	1340
Leu Ile Phe Trp Leu Ile Phe Ser Ile Met Gly Val Asn Leu Phe Ala		
1345	1350	1355 1360
Gly Lys Phe Tyr His Cys Ile Asn Tyr Thr Thr Gly Glu Met Phe Asp		
1365	1370	1375
Val Ser Val Val Asn Asn Tyr Ser Glu Cys Lys Ala Leu Ile Glu Ser		
1380	1385	1390
Asn Gln Thr Ala Arg Trp Lys Asn Val Lys Val Asn Phe Asp Asn Val		
1395	1400	1405
Gly Leu Gly Tyr Leu Ser Leu Leu Gln Val Ala Thr Phe Lys Gly Trp		
1410	1415	1420
Met Asp Ile Met Tyr Ala Ala Val Asp Ser Arg Asn Val Glu Leu Gln		
1425	1430	1435 1440
Pro Lys Tyr Glu Asp Asn Leu Tyr Met Tyr Leu Tyr Phe Val Ile Phe		
1445	1450	1455
Ile Ile Phe Gly Ser Phe Phe Thr Leu Asn Leu Phe Ile Gly Val Ile		

1460	1465	1470
Ile Asp Asn Phe Asn Gln Gln Lys Lys Lys Phe Gly Gly Gln Asp Ile		
1475	1480	1485
Phe Met Thr Glu Glu Gln Lys Lys Tyr Tyr Asn Ala Met Lys Lys Leu		
1490	1495	1500
Gly Ser Lys Lys Pro Gln Lys Pro Ile Pro Arg Pro Ala Asn Lys Phe		
1505	1510	1520
Gln Gly Met Val Phe Asp Phe Val Thr Lys Gln Val Phe Asp Ile Ser		
1525	1530	1535
Ile Met Ile Leu Ile Cys Leu Asn Met Val Thr Met Met Val Glu Thr		
1540	1545	1550
Asp Asp Gln Ser Gln Glu Met Thr Asn Ile Leu Tyr Trp Ile Asn Leu		
1555	1560	1565
Val Phe Ile Val Leu Phe Thr Gly Glu Cys Val Leu Lys Leu Ile Ser		
1570	1575	1580
Leu Arg Tyr Tyr Tyr Phe Thr Ile Gly Trp Asn Ile Phe Asp Phe Val		
1585	1590	1595
Val Val Ile Leu Ser Ile Val Gly Met Phe Leu Ala Glu Leu Ile Glu		
1605	1610	1615
Lys Tyr Phe Val Ser Pro Thr Leu Phe Arg Val Ile Arg Leu Ala Arg		
1620	1625	1630
Ile Gly Arg Ile Leu Arg Leu Ile Lys Gly Ala Lys Gly Ile Arg Thr		
1635	1640	1645
Leu Leu Phe Ala Leu Met Met Ser Leu Pro Ala Leu Phe Asn Ile Gly		
1650	1655	1660
Leu Leu Leu Phe Leu Val Met Phe Ile Tyr Ala Ile Phe Gly Met Ser		
1665	1670	1675
Asn Phe Ala Tyr Val Lys Arg Glu Val Gly Ile Asp Asp Met Phe Asn		
1685	1690	1695
Phe Glu Thr Phe Gly Asn Ser Met Ile Cys Leu Phe Gln Ile Thr Thr		
1700	1705	1710
Ser Ala Gly Trp Asp Gly Leu Leu Ala Pro Ile Leu Asn Ser Gly Pro		
1715	1720	1725
Pro Asp Cys Asp Pro Asp Lys Asp His Pro Gly Ser Ser Val Lys Gly		
1730	1735	1740
Asp Cys Gly Asn Pro Ser Val Gly Ile Phe Phe Phe Val Ser Tyr Ile		
1745	1750	1755
Ile Ile Ser Phe Leu Val Val Val Asn Met Tyr Ile Ala Val Ile Leu		

1765	1770	1775
Glu Asn Phe Ser Val Ala Thr	Glu Glu Ser Ala Glu Pro Leu Ser Glu	
1780	1785	1790
Asp Asp Phe Glu Met Phe Tyr Glu Val Trp Glu Lys Phe Asp Pro Asp		
1795	1800	1805
Ala Thr Gln Phe Ile Glu Phe Ala Lys Leu Ser Asp Phe Ala Asp Ala		
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Leu Asp Pro Pro Leu Leu Ile Ala Lys Pro Asn Lys Val Gln Leu Ile		
1825	1830	1835
Ala Met Asp Leu Pro Met Val Ser Gly Asp Arg Ile His Cys Leu Asp		
1845	1850	1855
Ile Leu Phe Ala Phe Thr Lys Arg Val Leu Gly Glu Ser Gly Glu Met		
1860	1865	1870
Asp Ala Leu Arg Ile Gln Met Glu Glu Arg Phe Met Ala Ser Asn Pro		
1875	1880	1885
Ser Lys Val Ser Tyr Glu Pro Ile Thr Thr Thr Leu Lys Arg Lys Gln		
1890	1895	1900
Glu Glu Val Ser Ala Ile Ile Ile Gln Arg Ala Tyr Arg Arg Tyr Leu		
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Leu Lys Gln Lys Val Lys Lys Val Ser Ser Ile Tyr Lys Lys Asp Lys		
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Gly Lys Glu Cys Asp Gly Thr Pro Ile Lys Glu Asp Thr Leu Ile Asp		
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Lys Leu Asn Glu Asn Ser Thr Pro Glu Lys Thr Asp Met Thr Pro Ser		
1955	1960	1965
Thr Thr Ser Pro Pro Ser Tyr Asp Ser Val Thr Lys Pro Glu Lys Glu		
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Arg Glu Ser Lys Lys		
2005		

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Lys Ala Lys Arg Pro Lys Gln Glu Arg Lys Asp Glu Asp Asp Glu Asn
35 40 45
Gly Pro Lys Pro Asn Ser Asp Leu Glu Ala Gly Lys Ser Leu Pro Phe
50 55 60
Ile Tyr Gly Asp Ile Pro Pro Glu Met Val Ser Val Pro Leu Glu Asp
65 70 75 80
Leu Asp Pro Tyr Tyr Ile Asn Lys Lys Thr Phe Ile Val Leu Asn Lys
85 90 95
Gly Lys Ala Ile Ser Arg Phe Ser Ala Thr Pro Ala Leu Tyr Ile Leu
100 105 110
Thr Pro Phe Asn Pro Ile Arg Lys Leu Ala Ile Lys Ile Leu Val His
115 120 125
Ser Leu Phe Asn Met Leu Ile Met Cys Thr Ile Leu Thr Asn Cys Val
130 135 140
Phe Met Thr Met Ser Asn Pro Pro Asp Trp Thr Lys Asn Val Glu Tyr
145 150 155 160
Thr Phe Thr Gly Ile Tyr Thr Phe Glu Ser Leu Ile Lys Ile Leu Ala
165 170 175
Arg Gly Phe Cys Leu Glu Asp Phe Thr Phe Leu Arg Asp Pro Trp Asn
180 185 190
Trp Leu Asp Phe Thr Val Ile Thr Phe Ala Tyr Val Thr Glu Phe Val
195 200 205
Asn Leu Gly Asn Val Ser Ala Leu Arg Thr Phe Arg Val Leu Arg Ala
210 215 220
Leu Lys Thr Ile Ser Val Ile Pro Gly Leu Lys Thr Ile Val Gly Ala
225 230 235 240
Leu Ile Gln Ser Val Lys Lys Leu Ser Asp Val Met Ile Leu Thr Val
245 250 255
Phe Cys Leu Ser Val Phe Ala Leu Ile Gly Leu Gln Leu Phe Met Gly
260 265 270
Asn Leu Arg Asn Lys Cys Leu Gln Trp Pro Pro Asp Asn Ser Ser Phe
275 280 285
Glu Ile Asn Ile Thr Ser Phe Phe Asn Asn Ser Leu Asp Gly Asn Gly
290 295 300
Thr Thr Phe Asn Arg Thr Val Ser Ile Phe Asn Trp Asp Glu Tyr Ile
305 310 315 320

Glu Asp Lys Ser His Phe Tyr Phe Leu Glu Gly Gln Asn Asp Ala Leu
 325 330 335
 Leu Cys Gly Asn Ser Ser Asp Ala Gly Gln Cys Pro Glu Gly Tyr Ile
 340 345 350
 Cys Val Lys Ala Gly Arg Asn Pro Asn Tyr Gly Tyr Thr Ser Phe Asp
 355 360 365
 Thr Phe Ser Trp Ala Phe Leu Ser Leu Phe Arg Leu Met Thr Gln Asp
 370 375 380
 Phe Trp Glu Asn Leu Tyr Gln Leu Thr Leu Arg Ala Ala Gly Lys Thr
 385 390 395 400
 Tyr Met Ile Phe Phe Val Leu Val Ile Phe Leu Gly Ser Phe Tyr Leu
 405 410 415
 Ile Asn Leu Ile Leu Ala Val Val Ala Met Ala Tyr Glu Glu Gln Asn
 420 425 430
 Gln Ala Thr Leu Glu Glu Ala Glu Gln Lys Glu Ala Glu Phe Gln Gln
 435 440 445
 Met Leu Glu Gln Leu Lys Lys Gln Gln Glu Glu Ala Gln Ala Ala Ala
 450 455 460
 Ala Ala Ala Ser Ala Glu Ser Arg Asp Phe Ser Gly Ala Gly Gly Ile
 465 470 475 480
 Gly Val Phe Ser Glu Ser Ser Ser Val Ala Ser Lys Leu Ser Ser Lys
 485 490 495
 Ser Glu Lys Glu Leu Lys Asn Arg Arg Lys Lys Lys Lys Gln Lys Glu
 500 505 510
 Gln Ser Gly Glu Glu Glu Lys Asn Asp Arg Val Leu Lys Ser Glu Ser
 515 520 525
 Glu Asp Ser Ile Arg Arg Lys Gly Phe Arg Phe Ser Leu Glu Gly Ser
 530 535 540
 Arg Leu Thr Tyr Glu Lys Arg Phe Ser Ser Pro His Gln Ser Leu Leu
 545 550 555 560
 Ser Ile Arg Gly Ser Leu Phe Ser Pro Arg Arg Asn Ser Arg Ala Ser
 565 570 575
 Leu Phe Ser Phe Arg Gly Arg Ala Lys Asp Ile Gly Ser Glu Asn Asp
 580 585 590
 Phe Ala Asp Asp Glu His Ser Thr Phe Glu Asp Asn Asp Ser Arg Arg
 595 600 605
 Asp Ser Leu Phe Val Pro His Arg His Gly Glu Arg Arg His Ser Asn
 610 615 620

Val Ser Gln Ala Ser Arg Ala Ser Arg Val Leu Pro Ile Leu Pro Met
625 630 635 640
Asn Gly Lys Met His Ser Ala Val Asp Cys Asn Gly Val Val Ser Leu
645 650 655
Val Gly Gly Pro Ser Thr Leu Thr Ser Ala Gly Gln Leu Leu Pro Glu
660 665 670
Gly Thr Thr Thr Glu Thr Glu Ile Arg Lys Arg Arg Ser Ser Ser Tyr
675 680 685
His Val Ser Met Asp Leu Leu Glu Asp Pro Thr Ser Arg Gln Arg Ala
690 695 700
Met Ser Ile Ala Ser Ile Leu Thr Asn Thr Met Glu Glu Leu Glu Glu
705 710 715 720
Ser Arg Gln Lys Cys Pro Pro Cys Trp Tyr Lys Phe Ala Asn Met Cys
725 730 735
Leu Ile Trp Asp Cys Cys Lys Pro Trp Leu Lys Val Lys His Leu Val
740 745 750
Asn Leu Val Val Met Asp Pro Phe Val Asp Leu Ala Ile Thr Ile Cys
755 760 765
Ile Val Leu Asn Thr Leu Phe Met Ala Met Glu His Tyr Pro Met Thr
770 775 780
Glu Gln Phe Ser Ser Val Leu Ser Val Gly Asn Leu Val Phe Thr Gly
785 790 795 800
Ile Phe Thr Ala Glu Met Phe Leu Lys Ile Ile Ala Met Asp Pro Tyr
805 810 815
Tyr Tyr Phe Gln Glu Gly Trp Asn Ile Phe Asp Gly Phe Ile Val Ser
820 825 830
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835 840 845
Leu Arg Ser Phe Arg Leu Leu Arg Val Phe Lys Leu Ala Lys Ser Trp
850 855 860
Pro Thr Leu Asn Met Leu Ile Lys Ile Ile Gly Asn Ser Val Gly Ala
865 870 875 880
Leu Gly Asn Leu Thr Leu Val Leu Ala Ile Ile Val Phe Ile Phe Ala
885 890 895
Val Val Gly Met Gln Leu Phe Gly Lys Ser Tyr Lys Glu Cys Val Cys
900 905 910
Lys Ile Ser Asn Asp Cys Glu Leu Pro Arg Trp His Met His Asp Phe
915 920 925

Phe His Ser Phe Leu Ile Val Phe Arg Val Leu Cys Gly Glu Trp Ile
930 935 940
Glu Thr Met Trp Asp Cys Met Glu Val Ala Gly Gln Thr Met Cys Leu
945 950 955 960
Thr Val Phe Met Met Val Met Val Ile Gly Asn Leu Val Val Leu Asn
965 970 975
Leu Phe Leu Ala Leu Leu Leu Ser Ser Phe Ser Ser Asp Asn Leu Ala
980 985 990
Ala Thr Asp Asp Asp Asn Glu Met Asn Asn Leu Gln Ile Ala Val Gly
995 1000 1005
Arg Met Gln Lys Gly Ile Asp Phe Val Lys Arg Lys Ile Arg Glu Phe
1010 1015 1020
Ile Gln Lys Ala Phe Val Arg Lys Gln Lys Ala Leu Asp Glu Ile Lys
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Pro Leu Glu Asp Leu Asn Asn Lys Lys Asp Ser Cys Ile Ser Asn His
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1075 1080 1085
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1090 1095 1100
Val Pro Ile Ala Val Gly Glu Ser Asp Phe Glu Asn Leu Asn Thr Glu
1105 1110 1115 1120
Glu Phe Ser Ser Glu Ser Asp Met Glu Glu Ser Lys Glu Lys Leu Asn
1125 1130 1135
Ala Thr Ser Ser Ser Glu Gly Ser Thr Val Asp Ile Gly Ala Pro Ala
1140 1145 1150
Glu Gly Glu Gln Pro Glu Val Glu Pro Glu Glu Ser Leu Glu Pro Glu
1155 1160 1165
Ala Cys Phe Thr Glu Asp Cys Val Arg Lys Phe Lys Cys Cys Gln Ile
1170 1175 1180
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1185 1190 1195 1200
Cys Tyr Lys Ile Val Glu His Asn Trp Phe Glu Thr Phe Ile Val Phe
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Met Ile Leu Leu Ser Ser Gly Ala Leu Ala Phe Glu Asp Ile Tyr Ile
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Glu Gln Arg Lys Thr Ile Lys Thr Met Leu Glu Tyr Ala Asp Lys Val
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 Phe Thr Tyr Ile Phe Ile Leu Glu Met Leu Leu Lys Trp Val Ala Tyr
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 Gly Phe Gln Val Tyr Phe Thr Asn Ala Trp Cys Trp Leu Asp Phe Leu
 1265 1270 1275 1280
 Ile Val Asp Val Ser Leu Val Ser Leu Thr Ala Asn Ala Leu Gly Tyr
 1285 1290 1295
 Ser Glu Leu Gly Ala Ile Lys Ser Leu Arg Thr Leu Arg Ala Leu Arg
 1300 1305 1310
 Pro Leu Arg Ala Leu Ser Arg Phe Glu Gly Met Arg Ala Val Val Asn
 1315 1320 1325
 Ala Leu Leu Gly Ala Ile Pro Ser Ile Met Asn Val Leu Leu Val Cys
 1330 1335 1340
 Leu Ile Phe Trp Leu Ile Phe Ser Ile Met Gly Val Asn Leu Phe Ala
 1345 1350 1355 1360
 Gly Lys Phe Tyr His Cys Ile Asn Tyr Thr Thr Gly Glu Met Phe Asp
 1365 1370 1375
 Val Ser Val Val Asn Asn Tyr Ser Glu Cys Lys Ala Leu Ile Glu Ser
 1380 1385 1390
 Asn Gln Thr Ala Arg Trp Lys Asn Val Lys Val Asn Phe Asp Asn Val
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 Gly Leu Gly Tyr Leu Ser Leu Leu Gln Val Ala Thr Phe Lys Gly Trp
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 1425 1430 1435 1440
 Pro Lys Tyr Glu Asp Asn Leu Tyr Met Tyr Leu Tyr Phe Val Ile Phe
 1445 1450 1455
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 1475 1480 1485
 Phe Met Thr Glu Glu Gln Lys Lys Tyr Tyr Asn Ala Met Lys Lys Leu
 1490 1495 1500
 Gly Ser Lys Lys Pro Gln Lys Pro Ile Pro Arg Pro Ala Asn Lys Phe
 1505 1510 1515 1520
 Gln Gly Met Val Phe Asp Phe Val Thr Lys Gln Val Phe Asp Ile Ser
 1525 1530 1535

Ile Met Ile Leu Ile Cys Leu Asn Met Val Thr Met Met Val Glu Thr
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 Asp Asp Gln Ser Gln Glu Met Thr Asn Ile Leu Tyr Trp Ile Asn Leu
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 1570 1575 1580
 Leu Arg Tyr Tyr Tyr Phe Thr Ile Gly Trp Asn Ile Phe Asp Phe Val
 1585 1590 1595 1600
 Val Val Ile Leu Ser Ile Val Gly Met Phe Leu Ala Glu Leu Ile Glu
 1605 1610 1615
 Lys Tyr Phe Val Ser Pro Thr Leu Phe Arg Val Ile Arg Leu Ala Arg
 1620 1625 1630
 Ile Gly Arg Ile Leu Arg Leu Ile Lys Gly Ala Lys Gly Ile Arg Thr
 1635 1640 1645
 Leu Leu Phe Ala Leu Met Met Ser Leu Pro Ala Leu Phe Asn Ile Gly
 1650 1655 1660
 Leu Leu Leu Phe Leu Val Met Phe Ile Tyr Ala Ile Phe Gly Met Ser
 1665 1670 1675 1680
 Asn Phe Ala Tyr Val Lys Arg Glu Val Gly Ile Asp Asp Met Phe Asn
 1685 1690 1695
 Phe Glu Thr Phe Gly Asn Ser Met Ile Cys Leu Phe Gln Ile Thr Thr
 1700 1705 1710
 Ser Ala Gly Trp Asp Gly Leu Leu Ala Pro Ile Leu Asn Ser Gly Pro
 1715 1720 1725
 Pro Asp Cys Asp Pro Asp Lys Asp His Pro Gly Ser Ser Val Lys Gly
 1730 1735 1740
 Asp Cys Gly Asn Pro Ser Val Gly Ile Phe Phe Phe Val Ser Tyr Ile
 1745 1750 1755 1760
 Ile Ile Ser Phe Leu Val Val Val Asn Met Tyr Ile Ala Val Ile Leu
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 Glu Asn Phe Ser Val Ala Thr Glu Glu Ser Ala Glu Pro Leu Ser Glu
 1780 1785 1790
 Asp Asp Phe Glu Met Phe Tyr Glu Val Trp Glu Lys Phe Asp Pro Asp
 1795 1800 1805
 Ala Thr Gln Phe Ile Glu Phe Ala Lys Leu Ser Asp Phe Ala Asp Ala
 1810 1815 1820
 Leu Asp Pro Pro Leu Leu Ile Ala Lys Pro Asn Lys Val Gln Leu Ile
 1825 1830 1835 1840

Ala Met Asp Leu Pro Met Val Ser Gly Asp Arg Ile His Cys Leu Asp
1845 1850 1855

Ile Leu Phe Ala Phe Thr Lys Arg Val Leu Gly Glu Ser Gly Glu Met
1860 1865 1870

Asp Ala Leu Arg Ile Gln Met Glu Glu Arg Phe Met Ala Ser Asn Pro
1875 1880 1885

Ser Lys Val Ser Tyr Glu Pro Ile Thr Thr Thr Leu Lys Arg Lys Gln
1890 1895 1900

Glu Glu Val Ser Ala Ile Ile Ile Gln Arg Ala Tyr Arg Arg Tyr Leu
1905 1910 1915 1920

Leu Lys Gln Lys Val Lys Lys Val Ser Ser Ile Tyr Lys Lys Asp Lys
1925 1930 1935

Gly Lys Glu Cys Asp Gly Thr Pro Ile Lys Glu Asp Thr Leu Ile Asp
1940 1945 1950

Lys Leu Asn Glu Asn Ser Thr Pro Glu Lys Thr Asp Met Thr Pro Ser
1955 1960 1965

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Arg Glu Ser Lys Lys
2005

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<212> DNA
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aaaagcctgt ggaagatcag ttccacaact gagagctttg ggctgcttca gacatatgtc 180
tgtgtgtacg ctgtgaagggt gtttctcttc acagttcccc gccctctagt ggtagttaca 240
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aaaaaaaaatt tttttttttt taaagcatga tggaatttta gctgcagtct tcttggggcc 420
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tggaggcact ataatactgg ggagggcagt ctgctagctg gtagctgaaa ggtcctgggt 780
tacttcaaca ttttttttaa ataaaactgt gcagtagttt ttgttatttt agggttccct 840
ctgttttatc tgggtgatgc tgcagaagtg aactgcataa cacatttcac tcttagaaat 900
gcattccata ta 912

<210> 38
<211> 722
<212> DNA
<213> Homo sapiens

<400> 38
ctcagtgcac gtaactgaca caatcacctc tatctaattg tcatgcttct tacctcctgt 60
tctgtagcac tttcttatgc aaggagctaa acagtgatta aaggagcagg atgaaaagat 120
ggcacagtca gtgctgggtac cgccaggacc tgacagcttc cgcttcttta ccagggaatc 180
ccttgctgct attgaacaac gcattgcaga agagaaaagct aagagacca aacaggaaacg 240
caaggatgag gatgatgaaa atggcccaaa gccaaacagt gacttggaag cagsaaaaatc 300
tcttccattt atttatggag acattcctcc agagatgggtg tcagtgcctc tggaggatct 360
ggacccctac tatatcaata agaaagttag ttcttagtca agttgcctc actgcctatt 420
tactaattgg ttctgggcta gtcccaggga tgatggtgaa gaaggctggc ctcttccct 480
ctgtctaaag tatcactaag atgctggatg ggctgaccg tgtaattggac caatgatcct 540
agaagtcttt tgggaagcact catttgaacc tgcatgtgtg agacaggcag agaactgggtg 600
aggcatcctc cagcgcgga attaaggga gacaaaagcc tattcacctt cttgaatata 660
aattatatgc ttaaaccagt gtaaattgac cctgattccc taataatgtt gagaagcaaa 720
aa 722

<210> 39
<211> 561
<212> DNA
<213> Homo sapiens

<400> 39
cctatggcat tgatcacaaa ttttcttaat aatcctcatg tcatttatca aatttaggaa 60
agtttatagt gtcagaaaaa aaaaagcatc tatcttcatg tcatatgatg gtaattatta 120
tggtatacac tattttacag ggcaatattt ataaataatg gttttacttt tctcttaaaa 180
tattcttaat atatatctta agttttgttt tatgtgttgt gttttctttt tcagacgttt 240
atagtattga ataaagggaa agcaatctct cgattcagtg ccacccctgc cctttacatt 300
ttaactccct tcaaccctat tagaaaatta gctattaaga ttttggtaca ttcatatcct 360
ttttcaaatc gtcacttaat atgattttct tctttgacca agttattgag ctacacattt 420
tccaaaatat ctgtgggttg caatgttatg tggtctttct ttttctttcc ttttactcaa 480
tcgttagcat gttgcaaaat gagatcacag gtaagtgaat tactttcccc cgtcttctaa 540
gtgtttcttc tctacccaac t 561

<210> 40
<211> 510
<212> DNA
<213> Homo sapiens

<400> 40
acctaaatag cctcaaaaata gttgatggct tggcctgaag acaagatcta aatatgaggt 60
tgctgagtta tagaaatggc aaaaaaaggt gtcaataata gaataataag caacaaaata 120
atagtaagca cttaaagttt aaacttcatg gtgggtgaagg catggtagtg cataaaagta 180
agatttttcc attgaacttt gtcttcttg acgatattct actttattca atatgctcat 240
tatgtgcacg attcttacca actgtgtatt tatgaccatg agtaaccctc cagactggac 300
aaagaatgtg gagtaagtat aaatatTTTT caatattgac ctccctttat gtttcatatt 360
gtgcttttaa caccttgaga cctcctcaat ttctttaaca aatcatgcta gctactgtta 420
accagaccct gattcaaatt catttctgtc actaaatgtc ttctaggaca aagctttag 480
tgggctcact tagttgtgta aattactgca 510

<210> 41
<211> 370
<212> DNA
<213> Homo sapiens

<220>
<221> modified_base
<222> (293)
<223> N = A, C, G, or T

<400> 41
taagatatgt acttgtaaat taaccactag atttttaatg tgagcttggc tattgtctct 60
caggtatacc tttaacaggaa ttataacttt tgaatcactt attaaaatac ttgcaagggg 120
cttttgttta gaagattttca cttttttacg ggatccatgg aattggttgg atttcacagt 180
cattactttt gcgtaagtat ctttaatacat tttctatcct ggaagagtaa atcactgggtg 240
ggagcctata ctatatatttc cttgggtggct tgccttgaca gaccaagcat ttntcttagt 300
aatcatagtt ttcttccaat caaattatcc agtttgagaa aattaggaac tatcatagta 360
aattacatgg 370

<210> 42
<211> 370
<212> DNA
<213> Homo sapiens
<220>
<221> modified_base
<222> (133)
<223> N = A, C, G, or T

<400> 42
caattagcac tgtaaagtaa taaagtttcc caaataacag agattatgat tgatgacaat 60
gccattttcc tcttaattgg gaaagctgat ggcgacactc atgaaattaa aaaggtcttg 120
atgaaagacc aangaagacg tagattttcc taaattctga ataactctga tttaattcta 180
caggtatgta acagaatttg taaacctagg caatgtttca gctcttcgaa ctttcagagt 240
cttgagagct ttgaaaacta tttctgtaat tccaggtaag aagaaaatgg tataaggtgg 300
taggcccctt atatctccaa ctgtttcttg tgttctgtca ttgtgtttgt gtgtgaacc 360
cctattacag 370

<210> 43
<211> 410
<212> DNA
<213> Homo sapiens

<400> 43
gtaagaagaa aatgggtataa ggtggtaggc cccttatatc tccaactggt tcttggtgtc 60
tgtcattgtg tttgtgtgtg aaccccttat tacagatatg tgacagagtt tgtggacctg 120
ggcaatgtct cagcgttgag aacattcaga gttctccgag cattgaaaac aatttcagtc 180
attccagggtg agagctagggt taaacaccga ggctgacttt agctacagtg gtgctacaat 240
cacagctttt gtgcagaagc cttgttgcta gttgcatatt gcaaataaat atgtaaaaaa 300
gcaagaattg gtacatcatt ttttggtatg atttgattct ttgcttttta cccggttgctt 360
tctttaaaac tattctaaat cagcctttga gtttaacaag tgttgcatga 410

<210> 44
<211> 1066
<212> DNA
<213> Homo sapiens

<220>
<221> modified_base
<222> (229)
<223> N = A, C, G, or T

<400> 44
aaagagtgtt tggaaataca catttggttc atttccattc acagttttct aatgaacata 60
caagttctgc ttccattcat ttccaccagc tagtaggctt ttcattgaaa tggtattcaa 120
tcacaaacat taaactaata ttgttgcat tctgcatgac atttttattt tccaggccaa 180
gctcatgata tttttgccgg taaaatagct gttgagtagt atatttaant tcccccttct 240
gattttgttt gtaggcctga agaccattgt gggggccctg atccagtcag tgaagaagct 300
ttctgatgtc atgatcttga ctgtgttctg tctaagcgtg tttgcgctaa taggattgca 360
gttggtcatg ggcaacctac gaaataaatg tttgcaatgg cctccagata attcttcctt 420
tgaaataaat atcaattcct tctttaacaa ttcattggat gggaatggta ctactttcaa 480
taggacagtg agcatattta actgggatga atatttgag gataaaagta agatatactc 540
tataaaccat taagttgttt agttctctaa atattaaata ttatatataa tggaaattat 600
ctcaatttag atgtgaatca agtgacttag actaatttaa gatgatttaa tacatataaa 660
agagatatca aaggatacct tattctattt ttsttatctg tccattgata tagtaaaagt 720
tctcatttga aaatgtgttg tcttatactc atgttgaaag taatttcata ttatgccata 780
ttaaaaaagg tttatttggt agacattaat caggtttttc agtcatttta ataaataagt 840
cagtagtttg aactattcmg cgtattccac tgaaatgtcg ttaagaagac tgaggggaaa 900
taatttgcc ctatttggtt gatgcaacat atgtattgag tacatatgct atatctgaaa 960
ctagagaaac catatatcaa gatgaaataa gaatttgtgt gctcctcaga aggttaagta 1020
accctgattt agccattcac ttcattccata ttctaattag tccctt 1066

<210> 45
<211> 385
<212> DNA
<213> Homo sapiens

<400> 45
gttcaattat tgtgaaaaat cttcttttagc catatatatt tattagttta tccatctcat 60
tatgattgaa aacatttgtg agctttgcc cctaaacagg gtggctgaag tgttttacag 120
gattttaatg attctttcta ttctttctc tttaaataagg tcaattttat tttttacagg 180
ggcaaaatga tgctctgctt tgtggcaaca gctcagatgc agggtaagtg tatgcttctc 240
actgagtttc agtccacact gctccatcag tgtcaataac ctgccacctc ccactcatcc 300
agtcccacca ctctcactc aaaaccctcc ataaattcta cttcacgggtg actctcagaa 360
tgaccaggat aagtgtagat tctca 385

<210> 46
<211> 430
<212> DNA
<213> Homo sapiens

<400> 46
tataataatg acaattatga atcacagagg aatccacaaa gtagacctta tagattctgt 60
cattatataa atcagtcac ttagtgctga gtttaagtact gggtaagggtg agagaaatcg 120
gcttttttct agtgccctga taaaacagac attggcatat attaaaacag gaaaaccaat 180
tagcagactt gccgttattg actycctctc ttctctctaa cctaattaca gccagtgtcc 240
tgaaggatac atctgtgtga aggctggtag aaaccccaac tatggctaca cgagctttga 300
cacctttagt tgggcctttt tgtccttatt tctgtctcatg actcaagact tctgggaaaa 360
cctttatcaa ctggtgagaa cagataaaat catttttctg agaatcataa aacaccgaac 420
tcaagagaat 430

<210> 47
<211> 646
<212> DNA
<213> Homo sapiens

<400> 47
tgctgtagaa tattttatta cttagagtgt aagtttgtaa catcctatat aaaattttatt 60
aaaatctctc ttccattttg cagacactac gtgctgctgg gaaaacgtac atgatatttt 120
ttgtgctggg catttttctg ggctcattct atctaataaa ttgatcttg gctgtgggtg 180
ccatggccta tgaggaacag aatcaggcca cattggaaga ggctgaacag aaggaagctg 240
aatttcagca gatgctcgaa cagttgaaaa agcaacaaga agaagctcag gtatagttaa 300
caagcatacg gtcctttgtt tttctgtatc taaattcttt aacctaaatg ttgaggctcag 360
tggaaggta gttgacatta gaaatagggtc atatgtgttt ggtaagtgtc aggagcctgt 420
ttggttatta agaagttatt actttattgc aatgatctct gtcaatagtg tcaatagtaa 480
tgccatcaaa aaatggataa ttataattgc ttactgaca ttttttctc ccttggtgact 540
ccttgaggaa attaatgatt aacaaaggcc tcatgtactc aaacttgtag agtagataaa 600
cctacatgtc ctcagttgaa gtattttctt aggggaagag gaattc 646

<210> 48
<211> 711
<212> DNA
<213> Homo sapiens

<220>
<221> modified_base
<222> (164)
<223> N = A, C, G, or T

<400> 48
tatgtatcat cttccatatg aatgcgcatt ttactctttg attggtctaa taacagtgtg 60
ctgtgttcta aaacacagaa taaaatggag aattgttttt caagattatc ttcattgat 120
tgaagctcaa ttaagcagta acatgataat tattttttta gatnatatgc aacttcccac 180
atactttgag cccttctagg cggcagctgc agccgcatct gctgaatcaa gagacttcag 240
tggtgctggg gggataggag ttttttcaga gagttcttca gtagcatcta agttgagctc 300
caaaagttaa aaagagctga aaacagaag aaagaaaaag aaacagaaag aacagtctgg 360
agaagaagag aaaaatgaca gaggcctaaa atcggaatct gaagacagca taagaagaaa 420
aggtttccgt ttttccttgg aaggaagtag gctgacatat gaaaagagat tttcttctcc 480
acaccaggta aaaatattaa attacatgaa ttgtgttctc ataaattttt taaaagaata 540
tgccagaatt taatggagag aaaaccgcct tccacctgga tggcacaatg ctttcagagt 600
agtgatgatt atcaagtgtt ttggctatca cttcagagaa tttgtgagtt ttgcaacttt 660
ttggaatccc aggaaggaaa ttttagatcc ctctgggttt ggaaaaattt g 711

<210> 49
<211> 1026
<212> DNA
<213> Homo sapiens

<400> 49
ttatggggac acttctgact atgttgaggt gtgggtaaag taggagaaaa gagagcagaa 60
gatggaaaat ggaggaagga gaaaaagcga gagtgaaata gaaaagggtg accttgtaga 120
aagtgccaaa atgccaccag cagtcacag aggggtgctt tcttccacat gtccaatgac 180
ttatccttga gtaagtcaat gactatgaca caatgaatca aattctgttt ttcagaatgc 240
cagctcttaa ctctcttcat ctcatctttg tttcttttct tgttatcat agtcttact 300
gagcatccgt ggctcccttt tctctccaag acgcaacagt agggcgagcc ttttcagctt 360

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cagaggtcga gcaaaggaca ttggctctga gaatgacttt gctgatgatg agcacagcac 420
ctttgaggac aatgacagcc gaagagactc tctgttcgtg ccgcacagac atggagaacg 480
gcgccacagc aatgtcagcc aggccagccg tgcctccagg gtgctcccca tcctgcccat 540
gaatgggaag atgcatagcg ctgtggactg caatggtgtg gtctccctgg tcggggggccc 600
ttctaccctc acatctgctg ggcagctcct accagagggtg aggccaacyy magattgcag 660
ctgatgtgaa gagagtgtg actggtgcag gcaggagtgy ttttccattt mcacatctaa 720
gaatttkttg agtttsttgc ccaaaggctg ggagtttgtt caatcaagct gttaactgtc 780
ttgtgaaact sttctattca gacttitycta caaagtaatt aaaaacctag gttggctgtc 840
agagaatata attagamgtm atctttcatc ayyattacta tggatatgaaa ctgcgcaaaa 900
agcaaagcaa caatttatca agcataatgt tygaytaata tagttaaatt aaatccaagg 960
aaattaatgc tcacaaatta aataaatact taaggatttt gtgattgttg ttcatttaaa 1020
aggaga 1026

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<210> 50
 <211> 601
 <212> DNA
 <213> Homo sapiens

```

<400> 50
ataggaaaagc ccaccttgac aaaccaggg ctccccaaaa gctgaaaatc tgacagactt 60
taaacaacccc ccaataaatt atcattccaa caatatctta gtgagctttt tacatctgag 120
aaagcatggt gtatatattag ttaaataaca cctgttgtag gaatgctttg ggctttgctg 180
ctttcaaaaa tagtggttat ttcattctgaa attctacttc tagggcacia ctactgaaac 240
agaaataaga aagagacggt ccagttctta tcatgtttcc atggatttat tggaaggtat 300
tacatcaagg caaagagcaa tgagtatagc cagtattttg accaacacca tggaaggtat 360
gttaaaagtc ctgcgtcaca gttacttggt gctttcctaa tgatgaaaaa cacttcataa 420
atlttaataa aatacttctt gacttgatat tgtatcatta ttacacattt tactaaataa 480
cagtaaaatc cgtgcataac tcatggattc atatattcca cagatttttt ttttttatat 540
ttagcctgta gaaagctgct gcaaagttaa ggtatatttg aacaccactt tcataactta 600
a 601

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<210> 51
 <211> 645
 <212> DNA
 <213> Homo sapiens

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<400> 51
gcttactagc ctttctgtac tgatcctttc tatgacagca aaccattgtt aaaattttcc 60
ctgttcctcc agcagattaa cccataatat cttttaacaa ctttagattt tttaaattcc 120
ttttaattta aaccaaattc gcttaataga aagtaagcag ttttcatgag gattctaact 180
ttttttcttc cagaacttga agaatccaga cagaaatgcc caccatgctg gtataaattt 240
gctaatatgt gtttgatttg ggactgttgt aaaccatggt taaaggtgaa acaccttgct 300
aacctgggtg taatggaccc atttggtgac ctggccatca ccactctgcat tgtcttaaat 360
acactcttca tggctatgga gcactatccc atgacggagc agttcagcag tgtactgtct 420
gttggaacc tggtaagcct cactgagagt ttctcttctt cttgaaagag tttataattg 480
ccttagtgaa ttttacatat tgctctcaaa ttaaataatca actaattggc catgtatatc 540
ttgacatcaa atgttttagc tcccttttaa ataacaaaaa aatgttgcta ccatagtgcg 600
aaagagtcaa agaatttatg tacaatttga tttagaattg aattt 645

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<210> 52
 <211> 485
 <212> DNA
 <213> Homo sapiens

<400> 52
 tggcccaaac caatttttaa atcaggaatt taatttwtat attggtggga gttaaattaa 60
 gttgctcaat aattattcgt gtttcaakas tatttgctca tataatgaac tacacttctc 120
 atttaggtct tcacagggat cttcacagca gaaatgtttc tcaagataat tgccatggat 180
 ccatattatt actttcaaga aggctggaat atttttgatg gttttattgt gagccttagt 240
 ttaatggaac ttggtttggc aaatgtggaa ggattgtcag ttctccgac attccggctg 300
 gtaaattaac tgggagtgtt cataaaatgt acttttrtaat taattagtct tcattctcat 360
 ctagtaaaaa tggcaagatt tcccatcatt ataatatatt tgaatacctt ctaaaacaga 420
 ttggattgcc ataccaccaa atggtagttt cttcttcac atagctttaa taaagtccac 480
 ttaaa 485

<210> 53
 <211> 602
 <212> DNA
 <213> Homo sapiens

<400> 53
 acagatttcc tcctgtgtcc atgtgactaa cccattgtgc acatgtaccc taaaaattag 60
 tatataataa taaaataaaa taaaaataaa aataaaaaaa taaaaataaa ataaaattgc 120
 agattttttt agaaatgcag agattaacac tgttcttgct tttatttcca gctccgagtt 180
 ttcaagttgg caaaatcttg gccaaactcta aatatgctaa ttaagatcat tggcaattct 240
 gtgggggctc taggaaacct caccttggtg ttggccatca tcgtcttcat ttttgctgtg 300
 gtcggcatgc agctctttgg taagagctac aaagaatgtg tctgcaagat ttccaatgat 360
 tgtgaactcc cacgctggca catgcatgac tttttccact ccttccctgat cgtgttccgc 420
 gtgctgtgtg gagagtggat agagaccatg tgggactgta tggaggtcgc tggccaaacc 480
 atgtgcctta ctgtcttcat gatggtcatg gtgattggaa atctagtggg atgtagcaaa 540
 aacattttcc tcattttcat taaaaataat gtaatcatta aaaagtgttc aactgaagaa 600
 ta 602

<210> 54
 <211> 803
 <212> DNA
 <213> Homo sapiens

<400> 54
 gtttcattta gcaatgattt cagtattttc tgcaatgact aataagcaaa tagtgataat 60
 agtattattt tatattgacc aagcattttt atttcattca ctttttttca gaatagtgtg 120
 tcatgaatta gcagaaatgc atgttagaat aaaataaggt gtcaagaaca atcttagaaa 180
 actaatgatg gaaagcaatt gaagcaatag aatgttttga tcacctgttt ttctgtgtgt 240
 gtttcagggt ctgaacctct tcttgccctt gcttttgagt tccttcagtt ctgacaatct 300
 tgctgccact gatgatgata acgaaatgaa taatctccag attgctgtgg gaaggatgca 360
 gaaaggaatc gattttgtta aaagaaaaat acgtgaattt attcagaaag cctttgttag 420
 gaagcagaaa gcttttagatg aaattaaacc gcttgaagat cttaaataa aaaaagacag 480
 ctgtatttcc aaccatacca ccatagaaat aggcaagac ctcaattatc tcaaagacgg 540
 aaatggaact actagtggca taggcagcag ttagaataaa tatgtcgtgg atgaaagtga 600
 ttacatgtca tttataaaca accctagcct cactgtgaca gtaccaattg ctgttgagga 660
 atctgacttt gaaaatttaa atactgaaga attcagcagc gagtcagata tggaggaaag 720
 caaagaggta aatgtttaa taaggagata ttttggtgta tataatctgt gttaaataac 780
 aggtgtttta tgcgtgtctc tgt 803

<210> 55
 <211> 615
 <212> DNA
 <213> Homo sapiens

<220>
<221> modified_base
<222> (90 - 386)
<223> N = A, C, G, or T

<400> 55
atctctatac taggctcaaa cagaagttat ttccgttggt agcaccatat ttttaaaga 60
aaaaaaaaata ctatgggtgt gtatctaata ttgtgacccc tgacctttac caaagcggat 120
tggcattatg ttttaagttct taattacaga tcaagaaaaa tgcatacaga agatgggggg 180
gggcacacct aattaatttt tatatttaga ttaaagaaaa taattaaatg tgtttttttg 240
tgggattgat tttcagaagc taaatgcaac tagttcatct gaaggcagca cggttgatat 300
tggagctccc gccgagggag aacagcctga ggttgaacct gaggaatccc ttgaacctga 360
agcctgtttt acagaagann nnnnnnaagc aaaacaataa catatgtggt cttgagtatc 420
ctcttttcta cccatttttt cctattttatt taaatgtctg tttatttgtc taccatctag 480
ttcatctatc tatctgtatc tatctatcta tctatctatc tagtaatcat ctataacctat 540
ccaacaactg tacattttatt tgtttttttt ttttgcattt gctgtttgaa aaaaaatgca 600
acgtttttaa ggcaa 615

<210> 56
<211> 400
<212> DNA
<213> Homo sapiens

<400> 56
gatagctttt gtaagcggaa gctatcttaa aaattaatgt tatttacaat gtattatcag 60
gtaataatgt aaatgaatct cccaccaaca caaatatacc taatcaaaga gtaatttttt 120
gtcttcatct ttttccaca tattttagac tgtgtacgga agttcaagtg ttgtcagata 180
agcatagaag aaggcaaagg gaaactctgg tggaatttga ggaaaacatg ctataagata 240
gtggagcaca attggttcga aaccttcatt gtcttcatga ttctgctgag cagtggggct 300
ctggtaggtg atgcatgatc cactccttca cctttcatct gaaatctttt ccctttccct 360
tcaatcaact catattacc cacttttaaat taagggtgtt 400

<210> 57
<211> 560
<212> DNA
<213> Homo sapiens

<400> 57
aaattactga aacccttggt tgactgaaat gccagtcag cagtcattta tgatcagata 60
atgataaagt aaaattcagc catgggaaac attaaacctt ccagccttag gcacctgata 120
agagcttgca tcgtttcctt ttttaagaaa tcatcaatta gagactgttt ctgatcataa 180
aatttaatat aattttttga cttacaggcc tttgaagata tatacattga gcagcgaaaa 240
accattaaga ccatgttaga atatgctgac aaggttttca cttacatatt cattctggaa 300
atgctgctaa agtgggttgc atatggtttt caagtgtatt ttaccaatgc ctgggtgctg 360
ctagacttcc tgattgttga tgtgagtatg ctgcactttg ctgctttatt cattggcata 420
tatgtaatat ttctagcaat ggtgcctgac acagtgtagg cactcagtaa cactgtatca 480
gcccaaatat aaattatgtt tctcatttca cagtgaagg atgcctcaaa acatttttta 540
ccaattttaa tacatatata 560

<210> 58
<211> 480
<212> DNA
<213> Homo sapiens

<400> 58
aaattcttag gcctttcccc aaacttacta agtcagactc tgctattggt gtttttaaca 60
agacccttg gtgatttga aactcatgaa agttcgagaa ttactgattc attgcataga 120
gcaaggctga actgtgtaga cttttttata tgtaaataag aaaattgtgt tgctttttct 180
gtataggtct cactggtag ctttaactgca aatgccttgg gttactcaga acttggtgcc 240
atcaaattccc tcagaacact aagagctctg aggccactga gagctttgtc ccggtttgaa 300
ggaatgaggg taagactgaa tgccttagag tttgtcagaa ttattattga gagcagactg 360
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<212> DNA

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cacctacaat agctttcaat ttcaattaac tcccttgggt ataagcatct aaactcatct 8820
tctttcaata taattgatgc tatctcctaa ttacttgggt gctaataaat gttacattct 8880
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aaactcttat tctcagtggg aaactccagt tgtaatgcat ntttttaaag acaatttgga 9060
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 <211> 1951
 <212> PRT
 <213> Homo sapiens

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 Phe Thr Arg Glu Ser Leu Ala Ala Ile Glu Lys Arg Ala Ala Glu Glu
 20 25 30
 Lys Ala Lys Lys Pro Lys Lys Glu Gln Asp Asn Asp Asp Glu Asn Lys
 35 40 45
 Pro Lys Pro Asn Ser Asp Leu Glu Ala Gly Lys Asn Leu Pro Phe Ile
 50 55 60

Tyr Gly Asp Ile	Pro Pro Glu Met Val Ser Glu Pro Leu Glu Asp Leu	65	70	75	80
Asp Pro Tyr Tyr	Ile Asn Lys Lys Thr Phe Ile Val Met Asn Lys Gly	85	90	95	
Lys Ala Ile Ser	Arg Phe Ser Ala Thr Ser Ala Leu Tyr Ile Leu Thr	100	105	110	
Pro Leu Asn Pro	Val Arg Lys Ile Ala Xaa Lys Ile Leu Val His Ser	115	120	125	
Leu Phe Ser Met	Leu Ile Met Cys Thr Ile Leu Thr Asn Cys Val Phe	130	135	140	
Met Thr Leu Ser	Asn Pro Pro Asp Trp Thr Lys Asn Val Glu Tyr Thr	145	150	155	160
Phe Thr Gly Ile	Tyr Thr Phe Glu Ser Leu Ile Lys Ile Leu Ala Arg	165	170	175	
Gly Phe Cys Leu	Glu Asp Phe Thr Phe Leu Arg Asp Pro Trp Asn Trp	180	185	190	
Leu Asp Phe Ser	Val Ile Val Met Ala Tyr Val Thr Glu Phe Val Asp	195	200	205	
Leu Gly Asn Val	Ser Ala Leu Arg Thr Phe Arg Val Leu Arg Ala Leu	210	215	220	
Lys Thr Ile Ser	Val Ile Pro Gly Leu Lys Thr Ile Val Gly Ala Leu	225	230	235	240
Ile Gln Ser Val	Lys Lys Leu Ser Asp Val Met Ile Leu Thr Val Phe	245	250	255	
Cys Leu Ser Val	Phe Ala Leu Ile Gly Leu Gln Leu Phe Met Gly Asn	260	265	270	
Leu Arg Asn Lys	Cys Leu Gln Trp Pro Pro Ser Asp Ser Ala Phe Glu	275	280	285	
Thr Asn Thr Thr	Ser Tyr Phe Asn Gly Thr Met Asp Ser Asn Gly Thr	290	295	300	
Phe Val Asn Val	Thr Met Ser Thr Phe Asn Trp Lys Asp Tyr Ile Gly	305	310	315	320
Asp Asp Ser His	Phe Tyr Val Leu Asp Gly Gln Lys Asp Pro Leu Leu	325	330	335	
Cys Gly Asn Gly	Ser Asp Ala Gly Gln Cys Pro Glu Gly Tyr Ile Cys	340	345	350	
Val Lys Ala Gly	Arg Asn Pro Asn Tyr Gly Tyr Thr Ser Phe Asp Thr	355	360	365	

Phe Ser Trp Ala Phe Leu Ser Leu Phe Arg Leu Met Thr Gln Asp Tyr
 370 375 380

Trp Glu Asn Leu Tyr Gln Leu Thr Leu Arg Ala Ala Gly Lys Thr Tyr
 385 390 395 400

Met Ile Phe Phe Val Leu Val Ile Phe Leu Gly Ser Phe Tyr Leu Val
 405 410 415

Asn Leu Ile Leu Ala Val Val Ala Met Ala Tyr Glu Gly Gln Asn Gln
 420 425 430

Ala Thr Leu Glu Glu Ala Glu Gln Lys Glu Ala Glu Phe Gln Gln Met
 435 440 445

Leu Glu Gln Leu Lys Lys Gln Gln Glu Glu Ala Gln Ala Val Ala Ala
 450 455 460

Ala Ser Ala Ala Ser Arg Asp Phe Ser Gly Ile Gly Gly Leu Gly Glu
 465 470 475 480

Leu Leu Glu Ser Ser Ser Glu Ala Ser Lys Leu Ser Ser Lys Ser Ala
 485 490 495

Lys Glu Trp Arg Asn Arg Arg Lys Lys Arg Arg Gln Arg Glu His Leu
 500 505 510

Glu Gly Asn Asn Lys Gly Glu Arg Asp Ser Phe Pro Lys Ser Glu Ser
 515 520 525

Glu Asp Ser Val Lys Arg Ser Ser Phe Leu Phe Ser Met Asp Gly Asn
 530 535 540

Arg Leu Thr Ser Asp Lys Lys Phe Cys Ser Pro His Gln Ser Leu Leu
 545 550 555 560

Ser Ile Arg Gly Ser Leu Phe Ser Pro Arg Arg Asn Ser Lys Thr Ser
 565 570 575

Ile Phe Ser Phe Arg Gly Arg Ala Lys Asp Val Gly Ser Glu Asn Asp
 580 585 590

Phe Ala Asp Asp Glu His Ser Thr Phe Glu Asp Ser Glu Ser Arg Arg
 595 600 605

Asp Ser Leu Phe Val Pro His Arg His Gly Glu Arg Arg Asn Ser Asn
 610 615 620

Gly Thr Thr Thr Glu Thr Glu Val Arg Lys Arg Arg Leu Ser Ser Tyr
 625 630 635 640

Gln Ile Ser Met Glu Met Leu Glu Asp Ser Ser Gly Arg Gln Arg Ala
 645 650 655

Val Ser Ile Ala Ser Ile Leu Thr Asn Thr Met Glu Glu Leu Glu Glu
 660 665 670

Ser Arg Gln Lys Cys Pro Pro Cys Trp Tyr Arg Phe Ala Asn Val Phe
 675 680 685
 Leu Ile Trp Asp Cys Cys Asp Ala Trp Leu Lys Val Lys His Leu Val
 690 695 700
 Asn Leu Ile Val Met Asp Pro Phe Val Asp Leu Ala Ile Thr Ile Cys
 705 710 715 720
 Ile Val Leu Asn Thr Leu Phe Met Ala Met Glu His Tyr Pro Met Thr
 725 730 735
 Glu Gln Phe Ser Ser Val Leu Thr Val Gly Asn Leu Val Phe Thr Gly
 740 745 750
 Ile Phe Thr Ala Glu Met Val Leu Lys Ile Ile Ala Met Asp Pro Tyr
 755 760 765
 Tyr Tyr Phe Gln Glu Gly Trp Asn Ile Phe Asp Gly Ile Ile Val Ser
 770 775 780
 Leu Ser Leu Met Glu Leu Gly Leu Ser Asn Val Glu Gly Leu Ser Val
 785 790 795 800
 Leu Arg Ser Phe Arg Leu Leu Arg Val Phe Lys Leu Ala Lys Ser Trp
 805 810 815
 Pro Thr Leu Asn Met Leu Ile Lys Ile Ile Gly Asn Ser Val Gly Ala
 820 825 830
 Leu Gly Asn Leu Thr Leu Val Leu Ala Ile Ile Val Phe Ile Phe Ala
 835 840 845
 Val Val Gly Met Gln Leu Phe Gly Lys Ser Tyr Lys Glu Cys Val Cys
 850 855 860
 Lys Ile Asn Asp Asp Cys Thr Leu Pro Arg Trp His Met Asn Asp Phe
 865 870 875 880
 Phe His Ser Phe Leu Ile Val Phe Arg Val Leu Cys Gly Glu Trp Ile
 885 890 895
 Glu Thr Met Trp Asp Cys Met Glu Val Ala Gly Gln Thr Met Cys Leu
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 Ile Val Phe Met Leu Val Met Val Ile Gly Asn Leu Val Val Leu Asn
 915 920 925
 Leu Phe Leu Ala Leu Leu Leu Ser Ser Phe Ser Ser Asp Asn Leu Ala
 930 935 940
 Ala Thr Asp Asp Asp Asn Glu Met Asn Asn Leu Gln Ile Ala Val Gly
 945 950 955 960
 Arg Met Gln Lys Gly Ile Asp Tyr Val Lys Asn Lys Met Arg Glu Cys
 965 970 975

Phe Gln Lys Ala Phe Phe Arg Lys Pro Lys Val Ile Glu Ile His Glu
980 985 990
Gly Asn Lys Ile Asp Ser Cys Met Ser Asn Asn Thr Gly Ile Glu Ile
995 1000 1005
Ser Lys Glu Leu Asn Tyr Leu Arg Asp Gly Asn Gly Thr Thr Ser Gly
1010 1015 1020
Val Gly Thr Gly Ser Ser Val Glu Lys Tyr Val Ile Asp Glu Asn Asp
1025 1030 1035 1040
Tyr Met Ser Phe Ile Asn Asn Pro Ser Leu Thr Val Thr Val Pro Ile
1045 1050 1055
Ala Val Gly Glu Ser Asp Phe Glu Asn Leu Asn Thr Glu Glu Phe Ser
1060 1065 1070
Ser Glu Ser Glu Leu Glu Glu Ser Lys Glu Lys Leu Asn Ala Thr Ser
1075 1080 1085
Ser Ser Glu Gly Ser Thr Val Asp Val Val Leu Pro Arg Glu Gly Glu
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Gln Ala Glu Thr Glu Pro Glu Glu Asp Leu Lys Pro Glu Ala Cys Phe
1105 1110 1115 1120
Thr Glu Gly Cys Ile Lys Lys Phe Pro Phe Cys Gln Val Ser Thr Glu
1125 1130 1135
Glu Gly Lys Gly Lys Ile Trp Trp Asn Leu Arg Lys Thr Cys Tyr Ser
1140 1145 1150
Ile Val Glu His Asn Trp Phe Glu Thr Phe Ile Val Phe Met Ile Leu
1155 1160 1165
Leu Ser Ser Gly Ala Leu Ala Phe Glu Asp Ile Tyr Ile Glu Gln Arg
1170 1175 1180
Lys Thr Ile Lys Thr Met Leu Glu Tyr Ala Asp Lys Val Phe Thr Tyr
1185 1190 1195 1200
Ile Phe Ile Leu Glu Met Leu Leu Lys Trp Val Ala Tyr Gly Phe Gln
1205 1210 1215
Thr Tyr Phe Thr Asn Ala Trp Cys Trp Leu Asp Phe Leu Ile Val Asp
1220 1225 1230
Val Ser Leu Val Ser Leu Val Ala Asn Ala Leu Gly Tyr Ser Glu Leu
1235 1240 1245
Gly Ala Ile Lys Ser Leu Arg Thr Leu Arg Ala Leu Arg Pro Leu Arg
1250 1255 1260
Ala Leu Ser Arg Phe Glu Gly Met Arg Val Val Val Asn Ala Leu Val
1265 1270 1275 1280

Gly Ala Ile Pro Ser Ile Met Asn Val Leu Leu Val Cys Leu Ile Phe
 1285 1290 1295
 Trp Leu Ile Phe Ser Ile Met Gly Val Asn Leu Phe Ala Gly Lys Phe
 1300 1305 1310
 Tyr His Cys Val Asn Met Thr Thr Gly Asn Met Phe Asp Ile Ser Asp
 1315 1320 1325
 Val Asn Asn Leu Ser Asp Cys Gln Ala Leu Gly Lys Gln Ala Arg Trp
 1330 1335 1340
 Lys Asn Val Lys Val Asn Phe Asp Asn Val Gly Ala Gly Tyr Leu Ala
 1345 1350 1355 1360
 Leu Leu Gln Val Ala Thr Phe Lys Gly Trp Met Asp Ile Met Tyr Ala
 1365 1370 1375
 Ala Val Asp Ser Arg Asp Val Lys Leu Gln Pro Val Tyr Glu Glu Asn
 1380 1385 1390
 Leu Tyr Met Tyr Leu Tyr Phe Val Ile Phe Ile Ile Phe Gly Ser Phe
 1395 1400 1405
 Phe Thr Leu Asn Leu Phe Ile Gly Val Ile Ile Asp Asn Phe Asn Gln
 1410 1415 1420
 Gln Lys Lys Lys Phe Gly Gly Gln Asp Ile Phe Met Thr Glu Glu Gln
 1425 1430 1435 1440
 Lys Lys Tyr Tyr Asn Ala Met Lys Lys Leu Gly Ser Lys Lys Pro Gln
 1445 1450 1455
 Lys Pro Ile Pro Arg Pro Ala Asn Lys Phe Gln Gly Met Val Phe Asp
 1460 1465 1470
 Phe Val Thr Arg Gln Val Phe Asp Ile Ser Ile Met Ile Leu Ile Cys
 1475 1480 1485
 Leu Asn Met Val Thr Met Met Val Glu Thr Asp Asp Gln Gly Lys Tyr
 1490 1495 1500
 Met Thr Leu Val Leu Ser Arg Ile Asn Leu Val Phe Ile Val Leu Phe
 1505 1510 1515 1520
 Thr Gly Glu Phe Val Leu Lys Leu Val Ser Leu Arg His Tyr Tyr Phe
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 Thr Ile Gly Trp Asn Ile Phe Asp Phe Val Val Val Ile Leu Ser Ile
 1540 1545 1550
 Val Gly Met Phe Leu Ala Glu Met Ile Glu Lys Tyr Phe Val Ser Pro
 1555 1560 1565
 Thr Leu Phe Arg Val Ile Arg Leu Ala Arg Ile Gly Arg Ile Leu Arg
 1570 1575 1580

Leu Ile Lys Gly Ala Lys Gly Ile Arg Thr Leu Leu Phe Ala Leu Met
 1585 1590 1595 1600

Met Ser Leu Pro Ala Leu Phe Asn Ile Gly Leu Leu Leu Phe Leu Val
 1605 1610 1615

Met Phe Ile Tyr Ala Ile Phe Gly Met Ser Asn Phe Ala Tyr Val Lys
 1620 1625 1630

Lys Glu Ala Gly Ile Asp Asp Met Phe Asn Phe Glu Thr Phe Gly Asn
 1635 1640 1645

Ser Met Ile Cys Leu Phe Gln Ile Thr Thr Ser Ala Gly Trp Asp Gly
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Leu Leu Ala Pro Ile Leu Asn Ser Ala Pro Pro Asp Cys Asp Pro Asp
 1665 1670 1675 1680

Thr Ile His Pro Gly Ser Ser Val Lys Gly Asp Cys Gly Asn Pro Ser
 1685 1690 1695

Val Gly Ile Phe Phe Phe Val Ser Tyr Ile Ile Ile Ser Phe Leu Val
 1700 1705 1710

Val Val Asn Ser Tyr Ile Ala Val Ile Leu Glu Asn Phe Ser Val Ala
 1715 1720 1725

Thr Glu Glu Ser Ala Glu Pro Leu Ser Glu Asp Asp Phe Glu Met Phe
 1730 1735 1740

Tyr Glu Val Trp Glu Lys Phe Asp Pro Asp Ala Thr Gln Phe Ile Glu
 1745 1750 1755 1760

Phe Ser Lys Leu Ser Asp Phe Ala Ala Ala Leu Asp Pro Pro Leu Leu
 1765 1770 1775

Ile Ala Lys Pro Asn Lys Val Gln Leu Ile Ala Met Asp Leu Pro Met
 1780 1785 1790

Val Ser Gly Asp Arg Ile His Cys Leu Asp Ile Leu Phe Ala Phe Thr
 1795 1800 1805

Lys Arg Val Leu Gly Glu Ser Gly Glu Met Asp Ala Leu Arg Ile Gln
 1810 1815 1820

Met Glu Asp Arg Phe Met Ala Ser Asn Pro Ser Lys Val Ser Tyr Glu
 1825 1830 1835 1840

Pro Ile Thr Thr Thr Leu Lys Arg Lys Gln Glu Glu Val Ser Ala Ala
 1845 1850 1855

Ile Ile Gln Arg Asn Phe Arg Cys Tyr Leu Leu Lys Gln Arg Leu Lys
 1860 1865 1870

Asn Ile Ser Ser Asn Tyr Asn Lys Glu Ala Ile Lys Gly Arg Ile Asp
 1875 1880 1885

Leu Pro Ile Lys Gln Asp Met Ile Ile Asp Lys Leu Asn Gly Asn Ser
1890 1895 1900

Thr Pro Glu Lys Thr Asp Gly Ser Ser Ser Thr Thr Ser Pro Pro Ser
1905 1910 1915 1920

Tyr Asp Ser Val Thr Lys Pro Asp Lys Glu Lys Phe Glu Lys Asp Lys
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Pro Glu Lys Glu Ser Lys Gly Lys Glu Val Arg Glu Asn Gln Lys
1940 1945 1950

<210> 68
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<223> Xaa = Any Set Containing N

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35 40 45

Pro Lys Pro Asn Ser Asp Leu Glu Ala Gly Lys Asn Leu Pro Phe Ile
50 55 60

Tyr Gly Asp Ile Pro Pro Glu Met Val Ser Glu Pro Leu Glu Asp Leu
65 70 75 80

Asp Pro Tyr Tyr Ile Asn Lys Lys Thr Phe Ile Val Met Asn Lys Gly
85 90 95

Lys Ala Ile Ser Arg Phe Ser Ala Thr Ser Ala Leu Tyr Ile Leu Thr
100 105 110

Pro Leu Asn Pro Val Arg Lys Ile Ala Xaa Lys Ile Leu Val His Ser
115 120 125

Leu Phe Ser Met Leu Ile Met Cys Thr Ile Leu Thr Asn Cys Val Phe
130 135 140

Met Thr Leu Ser Asn Pro Pro Asp Trp Thr Lys Asn Val Glu Tyr Thr
145 150 155 160

Phe Thr Gly Ile Tyr Thr Phe Glu Ser Leu Ile Lys Ile Leu Ala Arg
165 170 175

Gly Phe Cys Leu Glu Asp Phe Thr Phe Leu Arg Asp Pro Trp Asn Trp
 180 185 190

Leu Asp Phe Ser Val Ile Val Met Ala Tyr Val Thr Glu Phe Val Ser
 195 200 205

Leu Gly Asn Val Ser Ala Leu Arg Thr Phe Arg Val Leu Arg Ala Leu
 210 215 220

Lys Thr Ile Ser Val Ile Pro Gly Leu Lys Thr Ile Val Gly Ala Leu
 225 230 235 240

Ile Gln Ser Val Lys Lys Leu Ser Asp Val Met Ile Leu Thr Val Phe
 245 250 255

Cys Leu Ser Val Phe Ala Leu Ile Gly Leu Gln Leu Phe Met Gly Asn
 260 265 270

Leu Arg Asn Lys Cys Leu Gln Trp Pro Pro Ser Asp Ser Ala Phe Glu
 275 280 285

Thr Asn Thr Thr Ser Tyr Phe Asn Gly Thr Met Asp Ser Asn Gly Thr
 290 295 300

Phe Val Asn Val Thr Met Ser Thr Phe Asn Trp Lys Asp Tyr Ile Gly
 305 310 315 320

Asp Asp Ser His Phe Tyr Val Leu Asp Gly Gln Lys Asp Pro Leu Leu
 325 330 335

Cys Gly Asn Gly Ser Asp Ala Gly Gln Cys Pro Glu Gly Tyr Ile Cys
 340 345 350

Val Lys Ala Gly Arg Asn Pro Asn Tyr Gly Tyr Thr Ser Phe Asp Thr
 355 360 365

Phe Ser Trp Ala Phe Leu Ser Leu Phe Arg Leu Met Thr Gln Asp Tyr
 370 375 380

Trp Glu Asn Leu Tyr Gln Leu Thr Leu Arg Ala Ala Gly Lys Thr Tyr
 385 390 395 400

Met Ile Phe Phe Val Leu Val Ile Phe Leu Gly Ser Phe Tyr Leu Val
 405 410 415

Asn Leu Ile Leu Ala Val Val Ala Met Ala Tyr Glu Gly Gln Asn Gln
 420 425 430

Ala Thr Leu Glu Glu Ala Glu Gln Lys Glu Ala Glu Phe Gln Gln Met
 435 440 445

Leu Glu Gln Leu Lys Lys Gln Gln Glu Glu Ala Gln Ala Val Ala Ala
 450 455 460

Ala Ser Ala Ala Ser Arg Asp Phe Ser Gly Ile Gly Gly Leu Gly Glu
 465 470 475 480

Leu Leu Glu Ser Ser Ser Glu Ala Ser Lys Leu Ser Ser Lys Ser Ala
 485 490 495

Lys Glu Trp Arg Asn Arg Arg Lys Lys Arg Arg Gln Arg Glu His Leu
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Glu Gly Asn Asn Lys Gly Glu Arg Asp Ser Phe Pro Lys Ser Glu Ser
 515 520 525

Glu Asp Ser Val Lys Arg Ser Ser Phe Leu Phe Ser Met Asp Gly Asn
 530 535 540

Arg Leu Thr Ser Asp Lys Lys Phe Cys Ser Pro His Gln Ser Leu Leu
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Ser Ile Arg Gly Ser Leu Phe Ser Pro Arg Arg Asn Ser Lys Thr Ser
 565 570 575

Ile Phe Ser Phe Arg Gly Arg Ala Lys Asp Val Gly Ser Glu Asn Asp
 580 585 590

Phe Ala Asp Asp Glu His Ser Thr Phe Glu Asp Ser Glu Ser Arg Arg
 595 600 605

Asp Ser Leu Phe Val Pro His Arg His Gly Glu Arg Arg Asn Ser Asn
 610 615 620

Gly Thr Thr Thr Glu Thr Glu Val Arg Lys Arg Arg Leu Ser Ser Tyr
 625 630 635 640

Gln Ile Ser Met Glu Met Leu Glu Asp Ser Ser Gly Arg Gln Arg Ala
 645 650 655

Val Ser Ile Ala Ser Ile Leu Thr Asn Thr Met Glu Glu Leu Glu Glu
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Ser Arg Gln Lys Cys Pro Pro Cys Trp Tyr Arg Phe Ala Asn Val Phe
 675 680 685

Leu Ile Trp Asp Cys Cys Asp Ala Trp Leu Lys Val Lys His Leu Val
 690 695 700

Asn Leu Ile Val Met Asp Pro Phe Val Asp Leu Ala Ile Thr Ile Cys
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Ile Val Leu Asn Thr Leu Phe Met Ala Met Glu His Tyr Pro Met Thr
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Glu Gln Phe Ser Ser Val Leu Thr Val Gly Asn Leu Val Phe Thr Gly
 740 745 750

Ile Phe Thr Ala Glu Met Val Leu Lys Ile Ile Ala Met Asp Pro Tyr
 755 760 765

Tyr Tyr Phe Gln Glu Gly Trp Asn Ile Phe Asp Gly Ile Ile Val Ser
 770 775 780

Leu Ser Leu Met Glu Leu Gly Leu Ser Asn Val Glu Gly Leu Ser Val
 785 790 795 800
 Leu Arg Ser Phe Arg Leu Leu Arg Val Phe Lys Leu Ala Lys Ser Trp
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 Pro Thr Leu Asn Met Leu Ile Lys Ile Ile Gly Asn Ser Val Gly Ala
 820 825 830
 Leu Gly Asn Leu Thr Leu Val Leu Ala Ile Ile Val Phe Ile Phe Ala
 835 840 845
 Val Val Gly Met Gln Leu Phe Gly Lys Ser Tyr Lys Glu Cys Val Cys
 850 855 860
 Lys Ile Asn Asp Asp Cys Thr Leu Pro Arg Trp His Met Asn Asp Phe
 865 870 875 880
 Phe His Ser Phe Leu Ile Val Phe Arg Val Leu Cys Gly Glu Trp Ile
 885 890 895
 Glu Thr Met Trp Asp Cys Met Glu Val Ala Gly Gln Thr Met Cys Leu
 900 905 910
 Ile Val Phe Met Leu Val Met Val Ile Gly Asn Leu Val Val Leu Asn
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 Leu Phe Leu Ala Leu Leu Leu Ser Ser Phe Ser Ser Asp Asn Leu Ala
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 945 950 955 960
 Arg Met Gln Lys Gly Ile Asp Tyr Val Lys Asn Lys Met Arg Glu Cys
 965 970 975
 Phe Gln Lys Ala Phe Phe Arg Lys Pro Lys Val Ile Glu Ile His Glu
 980 985 990
 Gly Asn Lys Ile Asp Ser Cys Met Ser Asn Asn Thr Gly Ile Glu Ile
 995 1000 1005
 Ser Lys Glu Leu Asn Tyr Leu Arg Asp Gly Asn Gly Thr Thr Ser Gly
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 Tyr Met Ser Phe Ile Asn Asn Pro Ser Leu Thr Val Thr Val Pro Ile
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 Ala Val Gly Glu Ser Asp Phe Glu Asn Leu Asn Thr Glu Glu Phe Ser
 1060 1065 1070
 Ser Glu Ser Glu Leu Glu Glu Ser Lys Glu Lys Leu Asn Ala Thr Ser
 1075 1080 1085

Ser Ser Glu Gly Ser Thr Val Asp Val Val Leu Pro Arg Glu Gly Glu
 1090 1095 1100

Gln Ala Glu Thr Glu Pro Glu Glu Asp Leu Lys Pro Glu Ala Cys Phe
 1105 1110 1115 1120

Thr Glu Gly Cys Ile Lys Lys Phe Pro Phe Cys Gln Val Ser Thr Glu
 1125 1130 1135

Glu Gly Lys Gly Lys Ile Trp Trp Asn Leu Arg Lys Thr Cys Tyr Ser
 1140 1145 1150

Ile Val Glu His Asn Trp Phe Glu Thr Phe Ile Val Phe Met Ile Leu
 1155 1160 1165

Leu Ser Ser Gly Ala Leu Ala Phe Glu Asp Ile Tyr Ile Glu Gln Arg
 1170 1175 1180

Lys Thr Ile Lys Thr Met Leu Glu Tyr Ala Asp Lys Val Phe Thr Tyr
 1185 1190 1195 1200

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Thr Tyr Phe Thr Asn Ala Trp Cys Trp Leu Asp Phe Leu Ile Val Asp
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Val Ser Leu Val Ser Leu Val Ala Asn Ala Leu Gly Tyr Ser Glu Leu
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 1250 1255 1260

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 1265 1270 1275 1280

Gly Ala Ile Pro Ser Ile Met Asn Val Leu Leu Val Cys Leu Ile Phe
 1285 1290 1295

Trp Leu Ile Phe Ser Ile Met Gly Val Asn Leu Phe Ala Gly Lys Phe
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Tyr His Cys Val Asn Met Thr Thr Gly Asn Met Phe Asp Ile Ser Asp
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Val Asn Asn Leu Ser Asp Cys Gln Ala Leu Gly Lys Gln Ala Arg Trp
 1330 1335 1340

Lys Asn Val Lys Val Asn Phe Asp Asn Val Gly Ala Gly Tyr Leu Ala
 1345 1350 1355 1360

Leu Leu Gln Val Ala Thr Phe Lys Gly Trp Met Asp Ile Met Tyr Ala
 1365 1370 1375

Ala Val Asp Ser Arg Asp Val Lys Leu Gln Pro Val Tyr Glu Glu Asn
 1380 1385 1390

Leu Tyr Met Tyr Leu Tyr Phe Val Ile Phe Ile Ile Phe Gly Ser Phe
1395 1400 1405

Phe Thr Leu Asn Leu Phe Ile Gly Val Ile Ile Asp Asn Phe Asn Gln
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Gln Lys Lys Lys Phe Gly Gly Gln Asp Ile Phe Met Thr Glu Glu Gln
1425 1430 1435 1440

Lys Lys Tyr Tyr Asn Ala Met Lys Lys Leu Gly Ser Lys Lys Pro Gln
1445 1450 1455

Lys Pro Ile Pro Arg Pro Ala Asn Lys Phe Gln Gly Met Val Phe Asp
1460 1465 1470

Phe Val Thr Arg Gln Val Phe Asp Ile Ser Ile Met Ile Leu Ile Cys
1475 1480 1485

Leu Asn Met Val Thr Met Met Val Glu Thr Asp Asp Gln Gly Lys Tyr
1490 1495 1500

Met Thr Leu Val Leu Ser Arg Ile Asn Leu Val Phe Ile Val Leu Phe
1505 1510 1515 1520

Thr Gly Glu Phe Val Leu Lys Leu Val Ser Leu Arg His Tyr Tyr Phe
1525 1530 1535

Thr Ile Gly Trp Asn Ile Phe Asp Phe Val Val Val Ile Leu Ser Ile
1540 1545 1550

Val Gly Met Phe Leu Ala Glu Met Ile Glu Lys Tyr Phe Val Ser Pro
1555 1560 1565

Thr Leu Phe Arg Val Ile Arg Leu Ala Arg Ile Gly Arg Ile Leu Arg
1570 1575 1580

Leu Ile Lys Gly Ala Lys Gly Ile Arg Thr Leu Leu Phe Ala Leu Met
1585 1590 1595 1600

Met Ser Leu Pro Ala Leu Phe Asn Ile Gly Leu Leu Leu Phe Leu Val
1605 1610 1615

Met Phe Ile Tyr Ala Ile Phe Gly Met Ser Asn Phe Ala Tyr Val Lys
1620 1625 1630

Lys Glu Ala Gly Ile Asp Asp Met Phe Asn Phe Glu Thr Phe Gly Asn
1635 1640 1645

Ser Met Ile Cys Leu Phe Gln Ile Thr Thr Ser Ala Gly Trp Asp Gly
1650 1655 1660

Leu Leu Ala Pro Ile Leu Asn Ser Ala Pro Pro Asp Cys Asp Pro Asp
1665 1670 1675 1680

Thr Ile His Pro Gly Ser Ser Val Lys Gly Asp Cys Gly Asn Pro Ser
1685 1690 1695

Val Gly Ile Phe Phe Phe Val Ser Tyr Ile Ile Ile Ser Phe Leu Val
1700 1705 1710

Val Val Asn Ser Tyr Ile Ala Val Ile Leu Glu Asn Phe Ser Val Ala
1715 1720 1725

Thr Glu Glu Ser Ala Glu Pro Leu Ser Glu Asp Asp Phe Glu Met Phe
1730 1735 1740

Tyr Glu Val Trp Glu Lys Phe Asp Pro Asp Ala Thr Gln Phe Ile Glu
1745 1750 1755 1760

Phe Ser Lys Leu Ser Asp Phe Ala Ala Ala Leu Asp Pro Pro Leu Leu
1765 1770 1775

Ile Ala Lys Pro Asn Lys Val Gln Leu Ile Ala Met Asp Leu Pro Met
1780 1785 1790

Val Ser Gly Asp Arg Ile His Cys Leu Asp Ile Leu Phe Ala Phe Thr
1795 1800 1805

Lys Arg Val Leu Gly Glu Ser Gly Glu Met Asp Ala Leu Arg Ile Gln
1810 1815 1820

Met Glu Asp Arg Phe Met Ala Ser Asn Pro Ser Lys Val Ser Tyr Glu
1825 1830 1835 1840

Pro Ile Thr Thr Thr Leu Lys Arg Lys Gln Glu Glu Val Ser Ala Ala
1845 1850 1855

Ile Ile Gln Arg Asn Phe Arg Cys Tyr Leu Leu Lys Gln Arg Leu Lys
1860 1865 1870

Asn Ile Ser Ser Asn Tyr Asn Lys Glu Ala Ile Lys Gly Arg Ile Asp
1875 1880 1885

Leu Pro Ile Lys Gln Asp Met Ile Ile Asp Lys Leu Asn Gly Asn Ser
1890 1895 1900

Thr Pro Glu Lys Thr Asp Gly Ser Ser Ser Thr Thr Ser Pro Pro Ser
1905 1910 1915 1920

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Pro Glu Lys Glu Ser Lys Gly Lys Glu Val Arg Glu Asn Gln Lys
1940 1945 1950

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<211> 1380

<212> DNA

<213> Homo sapiens

<400> 69

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gatggattat ttttattttt tttatgtatt gtgtgcttca atataccta aaataatatt 180
agctagggtt actgatgtat agaattcttt tctacattta gatatttctt gcaaattgtt 240
taccagaaag caacacaaaa atactatcag tgagtatgtg tttacactgt tctctaagga 300
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<210> 70

<211> 840

<212> DNA

<213> Homo sapiens

<400> 70

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tggteccatt ctccctaatt catgctaggg catgctttta acaagggtca aatatcttgc 180
tttgcatcat ccttgctttc tcgatccagg gccataaaaa aaaaaggat aaaaccaga 240
cacagagcca gagcaccct atgccaaatg tcaaagatta taggctaatt tcacctgtat 300
tctctttcta cagagattat ggagcaagaa aactgaagcc aagccacatc aaggtttgac 360
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aaagaaggca gaggggtgtt ttcttccttc ctctaccagt ttgttcttcc aaagaggcaa 660
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tgatgtaaga aagagagatt aactcagttt tttttttgtt tttgtttttt tgttgtgtt 780
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<210> 71

<211> 780

<212> DNA

<213> Homo sapiens

<400> 71

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ataaaattat gtaagaactc tgtataataa gctcacagag tacaagaaag gagaggaaaa 180
aagtaaaaga gaactggaa agaactatga gggatttcca aacagcaaaa ttgtcattga 240
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aaaccctaatt tctcttgagc gggaaaagct gagagtctgg aactagccta tcttccgagg 360
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tcaaattctt tattccagcc cttgataagt aaataagaag gtaaaggact atttatttgt 480
aaaaagtttt tcatgatttt gtgatggcac cttgttccat atcatctcag ataaatcaga 540
ataatttgtg aaaattactc ggtgatttcc acattagata ttttaaacct aatgttattt 600
ctaaaacaaa aaccaaccag gagaatccaa ttaagtaaaa tgtatgtatt aatataaatt 660
agctattccc atctggaaaa gggcagccat ttctgtgttg aggtgcctca atgatactga 720
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<210> 72
 <211> 1025
 <212> DNA
 <213> Homo sapiens

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<400> 72
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agaatttttt aaatgctttt aaaaaatgga caaaattata gatattcttg agtttaaata 180
taatgtttat atattatata tactgtacat tgtagaatgg ctaaatacaa ctaattaaca 240
ttaagtacag acttttgata gatttatgaa cttggcttat tgagaatgag gttgaatgat 300
gatgttttca agttcaaatg tgtagtgcag tactaaaagc atgacttaat gtttatagct 360
ttaaaaagtt actaaagaat gacatttttg ttgatgttct tatgcccaat cgcttgcttt 420
cctaactctt gtgcaatttt tctttttatt gcaggtaatt cgtatgcaag aagctacacg 480
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aaagccaaga agcccaaaaa ggaacaagat aatgatgatg agaacaaacc aaagccaaat 660
agtgaacttg aagctggaaa gaaccttcca tttatttatg gagacattcc tccagagatg 720
gtgtcagagc ccctggagga cctggatccc tactatatca ataagaaagt gagtattgat 780
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atatacagca tcacaatttt tcttctgtta aagattttat aataactctt actgtcactt 900
atttttatca caatataata aaacaaacat ttataagaaa tgaagtcaag agttgggttac 960
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caaaa 1025

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<210> 73
 <211> 433
 <212> DNA
 <213> Homo sapiens

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<400> 73
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ctccttaaatt aagcccatgt ctaatttagt aattttactc gtattttctg tttcagactt 180
ttatagtaat gaataaagga aaggcaattt cccgattcag tgccacctct gccttgata 240
ttttaactcc actaaaccct gttaggaaaa ttgctabsaa gattttggta cattcatatc 300
cttttaaatgt gaattgccta aatgctattt ctaacagttg attttaaga aaatgtcagt 360
tatattttca agtatctgta aaatttcttt gagattaatg gtaacattgt tagtttaatt 420
catttatttg cat 433

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<210> 74
 <211> 450
 <212> DNA
 <213> Homo sapiens

<400> 74
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aacaaataat attaatttca cagtttttgc atcgataaac ttttttgtgt gttttggatc 120
atttataaat ggccatggta acctactaac atttattcct taactataat ctactttatt 180
cagcatgctt atcatgtgca ctattttgac caactgtgta tttatgacct tgagcaaccc 240
tcctgactgg acaaagaatg tagagtaagt aggaataact tctgggaatg agaaatgcac 300
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ctaagaaaag ttattttcat aatatgcagc cggttaaggga ggtctttcgg gggagctatt 420
cttctacgag gtaagtattt tcccacaaaa 450

<210> 75
<211> 701
<212> DNA
<213> Homo sapiens

<400> 75
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accagattag attcctaaag aatatatttt ctcttcagtt taactctttg ctcaggcttg 180
taaaactaac taaatgaata gattatttgg taaatagaag taaggaacaa tattttaatg 240
aattgaaaaa ccacaaaagg ataggatttg ctatgattga aaacatttat ttttaacagt 300
caagcaaaat tgttaatttt ggcttggatg tttttcctag gtacacattc actggaatct 360
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catatattaa atgtagagct ttcttgtag tcaagttaac tatatgggtt gtgtattttc 600
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gggttatctt catgtcatat agtctttctc ttcacaaaa t 701

<210> 76
<211> 286
<212> DNA
<213> Homo sapiens

<400> 76
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aagcctagga aatgtttcag cccttcgaac tttcagagtc ttgagagctc tgaaaactat 180
ttctgtaatc ccaggtaaga agaaactggt gtaaggtagt aggccccta tatctccaac 240
ttttcttgtg tgttattgtg tttgtgtgtg aactccccta ttacag 286

<210> 77
<211> 515
<212> DNA
<213> Homo sapiens

<400> 77
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aatgtctcag cgttgagaac attcagagtt ctccgagcac tgaaaacaat ttcagtcatt 180
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ccaaatgatg tttcaatgtc agtttagctc ctaaaatttt ataaattaca tgcgtattta 360
taaagtcagc ctttgagttt aacagaaaat tgcattgagc atcttcaaaa aatgctaatt 420

tgggcctctt gcgctctctc tctctctttt tcaactacat ggctttacta acagatttgg 480
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<210> 78
 <211> 564
 <212> DNA
 <213> Homo sapiens

<400> 78
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 aatggcaciaa tggattcaaa tgggacattt gttaatgtaa caatgagcac atttaactgg 480
 aaggataaca ttggagatga cagtaagaag tattacatta tgtaaacctt agtgttgctg 540
 aatgaatttt caactataaa tagt 564

<210> 79
 <211> 497
 <212> DNA
 <213> Homo sapiens

<400> 79
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 aggtcacttt tatgttttgg atgggcaaaa agacccttta ctctgtggaa atggttcaga 180
 tgcagggtaa gaaacataat atatatTTTT aagatataga actctttgctg aaaaaaaaaa 240
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<210> 80
 <211> 501
 <212> DNA
 <213> Homo sapiens

<400> 80
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 tcatctgata agtttcacgg tgggcaatca cctaaagtgt tctggaaatt aaagcaagat 180
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 aatgaaaagc ataggctgag t 501

<210> 81

<211> 432
<212> DNA
<213> Homo sapiens

<400> 81
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ctcaggctact gagtataaaa mgcaaagatt tatcattatt attmtagtt tctaagtaga 360
aatagtgtta tactatagag ggtagattgg aactgctttt tcattttata tatmggcatt 420
gtcattagac ac 432

<210> 82
<211> 489
<212> DNA
<213> Homo sapiens

<400> 82
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tactaagtgc tctggtttct ttgtcattgc tattgctttt tagtttttgt attttgtttt 420
ggtacacttt tgtactatct gtacttcagt tgagggacag ggaactaaca tttaatatag 480
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<210> 83
<211> 653
<212> DNA
<213> Homo sapiens

<400> 83
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caatagcaaa acaagcattt tcagtttcag aggtcgggca aaggatgttg gatctgaaaa 360
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cccagagggtg ataatagatg acctagctgc tactgacatt attcaccaat ttg 653

<210> 84
<211> 566
<212> DNA
<213> Homo sapiens

<220>

<221> modified_base
<222> (477)
<223> N = A, C, G, or T

<400> 84
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<210> 85
<211> 748
<212> DNA
<213> Homo sapiens

<400> 85
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gtcttaccag ttgtaaacgt ctcaaaat 748

<210> 86
<211> 664
<212> DNA
<213> Homo sapiens

<400> 86
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aagaatgatg aaagcattca aaatactcta taatgattag gtatgtaggg cacatttagaa 540
aacctacaag tacttttctaa aactgtgttt taagtatttg aagctttttt ggccttacag 600
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tact 664

<210> 87
<211> 750
<212> DNA
<213> Homo sapiens

<400> 87
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ccacgtgtgg ttctatgata ccacatacta ataaaataat gtctaaaatt atattatgat 180
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aacttctcct gggctctggt ttcccatatt 750

<210> 88
<211> 768
<212> DNA
<213> Homo sapiens

<400> 88
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atagtaagca ttcaataaac atttgttgaa ataatttttag caaagatcta tgagttccct 120
ttttaggctg ttattttaa gcatatttca atattaarat aggcattttt ctttttttct 180
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ctgctactga tgaatgacaat gaaatgaata atctgcagat tgcagtagga agaatgcaa 300
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ggaatgcttt taaatttttt gttccatttc ctatgataac catgtactac agttattttac 720
tattttcatt gtgcttatat gcattatcga aaagcaatga ttgtaagt 768

<210> 89
<211> 471
<212> DNA
<213> Homo sapiens

<400> 89
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aaccggaagc ttgttttact gaaggtaaac aagctctgat gtgattaaat acaatctccc 300
cttgttcttt acggagactg aatatgcctc atttaaaaaa aaaaatttag caaacgaggt 360
gtgggtggctt atgcctgtaa ccccaaaatt ttgggagggt acggtaggag gattgcttga 420
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<210> 90
<211> 623
<212> DNA
<213> Homo sapiens

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gagtggggaa ggggcaagaa agtttatttt ttctatttta agattaaaat atatttttta 180
attaactata ttttattttt aggatgtatt aaaaagtttc cattctgtca agtaagtaca 240
gaagaaggca aagggaagat ctggtggaat cttcgaaaaa cctgctacag tattgttgag 300
cacaactggg ttgagacttt cattgtgttc atgatccttc tcagtagtgg tgcattggta 360
agtgaatgc atattggcaa gaatcagatt ctggtgaaat agtttattct ccaaaattac 420
cagatgcaaa cactgagctt cagaatcaaa agaaaaggca tatctgtgtc ttgcagagct 480
tggcacccaa ggtttaacga tgcaaaattc agttctgaac aaatcagcac catgaaacag 540
ccagatggaa tttctcatct ggtgtttatc taacagatgt tttcctcact gagacaacca 600
tttcagaga cattctgtaa cca 623
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<210> 91
<211> 520
<212> DNA
<213> Homo sapiens

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<400> 91
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ccatttaagt aaaataaaat atttttgatt cataggcctt tgaagatata tacattgaac 180
agcgaaagac tatcaaaacc atgctagaat atgctgacaa agtctttacc tatatattca 240
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ggtgctggct agatttcttg atcgttgatg taagtatttt aagtgatttt tataaaattg 360
tttttaaaag aggcaagttt gacatttcat atgtttctgt tattaataact ttcactaata 420
atgacataat tatgcagtta tttaaacaaa actgtaacat atgcaacaat gaggaatatc 480
tcatgggaaa gagtagagga ggtcctaaac atgggcagtg 520
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<210> 92
<211> 595
<212> DNA
<213> Homo sapiens

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<400> 92
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attgacacgt gttgataaat atgggcaagt attctggttt cattgggtta aaaaaagcaa 180
tagtatgaga tgagactggc aatataagat gaccccaacta tgtggaagat gaaagttgcc 240
aaggtagtgc caaattagta tttagtctgc attaaataga taccacaccc tataccttca 300
gtcaacagtt tatttcttgg tgaactaatt aatttttttt tcctttttgta ggtttctttg 360
gttagcctgg tagccaatgc tcttggtac tcagaactcg gtgccatcaa atcattacgg 420
acattaagag cttaagacc tctaagagcc ttatcccggg ttgaaggcat gagggtaaga 480
agaatagaca ctctaattat tcatgtcaaa aattacatgt aggtaatgat ttagatagaa 540
aagggtgcca tactcttctg atattttatt caatagaaat tacagaatta gaagc 595
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<210> 93

<211> 787
<212> DNA
<213> Homo sapiens

<400> 93
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ttttccttca aatatgtgct agaaaaatta gaagaaacaa cttgtccacc tagattttta 180
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caagcaagct cgggtgaaaa acgtgaaagt aaactttgat aatggtggcg ctggctatct 540
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tcaaggaaga ttatttcctt gatgttcttc gtttgaatga ctaacatttg acagcatgaa 660
aaaaagttaa tgataacacc tataatatca gcttgaattg atcataaaaa agatgttaca 720
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tatttct 787

<210> 94
<211> 438
<212> DNA
<213> Homo sapiens

<400> 94
aaaggaaaca agttccagac tttaaataca aatgtttttc tatttcaatt ttatttcaat 60
ctcttgatat gaaatttcac aatattgtac aaaaagttat ttgttataat actgtcagat 120
tttcatctgg tttaatgtca ttgttaggtg aaatttttat gaacaattca aatatatgtt 180
atttacaggc cacattttaa ggctggatgg atattatgta tgcagctgtt gattcacgag 240
atgtaagtat cactcaaata ttatttatag gttctagatt tcttatgggtg aatattgggtg 300
gtaattttaa cactgataca tccaaaattc tatattagaa catttaatat tgcataataa 360
aaatgaacag tctgcttcaa tatagatgat gcttgattaa tgtgtgccta atatacaata 420
ttagctaat atgaaacg 438

<210> 95
<211> 637
<212> DNA
<213> Homo sapiens

<400> 95
gtaaggcaca atgggaaaag agaatcaaga acaatcataa aacttgcaaa ctttcatttt 60
actagatcat actagtttta aaaaattggt tttgtagaac aatatctcag ggtaaggcaa 120
aagtagcact gtattaaagta acagcactca ataaattact gatttagtgt aagtatttat 180
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taaccagaat acctgtgggtc atgacagact taaatcatgt ttatattatt ttcagttgcc 480
catgtgggtta tttaagctgc agggattcca gcctctagtc agtggctcct ctcaaagttt 540
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tctccagtgc tttagcttgg cttacagagc ctttcag 637

<210> 96

<211> 637
<212> DNA
<213> Homo sapiens

<400> 96
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aagcaggata aatgtatatg taggaggata atatccactt aaaaattaga aaagattaaa 180
ggaaagacaa atatTTTTTg tgaaagtact attggaacac agaattgtaa ccagttttat 240
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catatTTTgc atcataattc acaacttctg cactcattag gagttaccac attccaaaaa 540
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<210> 97
<211> 759
<212> DNA
<213> Homo sapiens

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cgtatgtgga agggctttat ctacaatttt actgcattat tctttatgaa atatatatag 180
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aacactagca tatttgaata aaaactctga aacctgggtt tattcacaaa gctaactagt 660
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ttatcaggta ctctcctaata cttaaacc aa ggtcacagg 759

<210> 98
<211> 3975
<212> DNA
<213> Homo sapiens

<400> 98
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<210> 99
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
oligonucleotide

<400> 99
tgtgttctgc cccagtgaga ct 22

<210> 100
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
oligonucleotide

<400> 100
cttcctgctc tgcccaaact gaat 24

<210> 101
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
oligonucleotide

<400> 101
ggcgatgtaa tgtaaggtgc tgtc 24

<210> 102
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
oligonucleotide

<400> 102
gtgccttcag ttgcaattgt tcag 24

<210> 103
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
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 oligonucleotide

<400> 103
 ttaggaattt catatgcaga ataa 24

<210> 104
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
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 oligonucleotide

<400> 104
 tgggccattt ttcgtcgtc 19

<210> 105
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
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 oligonucleotide

<400> 105
 gaaagacgca ttgcagaaga aaagg 25

<210> 106
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic
 oligonucleotide

<400> 106
 ctattggcat gtgttggtgc taca 24

<210> 107
 <211> 25
 <212> DNA
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<220>
 <223> Description of Artificial Sequence: synthetic
 oligonucleotide

<400> 107

gtgctggttt ctcatttaac ttac

25

<210> 108

<211> 25

<212> DNA

<213> Artificial Sequence

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oligonucleotide

<400> 108

ttcccaactt aatttgatat ttagc

25

<210> 109

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

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oligonucleotide

<400> 109

gcagtttggg cttttcaatg ttag

24

<210> 110

<211> 24

<212> DNA

<213> Artificial Sequence

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oligonucleotide

<400> 110

gacacagttt caraatcccr aatg

24

<210> 111

<211> 24

<212> DNA

<213> Artificial Sequence

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oligonucleotide

<400> 111

ttagggctac gtttcatttg tatg

24

<210> 112

<211> 24

<212> DNA
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oligonucleotide

<400> 112
agcactgatg gaaaaccaaa ctat

24

<210> 113
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
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oligonucleotide

<400> 113
agcccatgca gtaatataaa tcct

24

<210> 114
<211> 24
<212> DNA
<213> Artificial Sequence

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oligonucleotide

<400> 114
tccaggctga taagctatgt ctaa

24

<210> 115
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<212> DNA
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oligonucleotide

<400> 115
ctgtggcctg cctgagcgta tt

22

<210> 116
<211> 24
<212> DNA
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<220>
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oligonucleotide

<400> 116 24
ccaattctac tttttaagga aatg

<210> 117
<211> 19
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oligonucleotide

<400> 117 19
aaatacttgt gcctttgaa

<210> 118
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<212> DNA
<213> Artificial Sequence

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oligonucleotide

<400> 118 23
gtacatacaa tatacacaga tgc

<210> 119
<211> 23
<212> DNA
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oligonucleotide

<400> 119 23
aggcagcaga acgacttgta ata

<210> 120
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
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oligonucleotide

<400> 120 24
atccgggtttt aatttcataa ctca

<210> 121
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
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oligonucleotide

<400> 121
gttgagcacc cttagtgaat aata

24

<210> 122
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
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oligonucleotide

<400> 122
tcacacgctc tagactactt ctct

24

<210> 123
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
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oligonucleotide

<400> 123
tgcaaatact tcagcccttt caaa

24

<210> 124
<211> 22
<212> DNA
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<220>
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oligonucleotide

<400> 124
ttccccacca gactgctctt tc

22

<210> 125
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gcagcaggca ggctctca

18

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<400> 126

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24

<210> 127

<211> 24

<212> DNA

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oligonucleotide

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ataatcttgc aaaatgaaat caca

24

<210> 128

<211> 19

<212> DNA

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oligonucleotide

<400> 128

atccgggatg acctactgg

19

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23

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21

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22

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17

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<400> 203
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oligonucleotide

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22

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22

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<400> 213
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18

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24

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oligonucleotide

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24

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oligonucleotide

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oligonucleotide

<400> 226
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24

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<400> 229
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<210> 232

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oligonucleotide

<400> 246
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<210> 247
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23

<210> 366

<211> 21

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: synthetic
oligonucleotide

<400> 366

aagggggaaa atcacatctt t

21

<210> 367

<211> 24

<212> DNA

<213> Artificial Sequence

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oligonucleotide

<400> 367

ttaaagagg catattcagt ctcc

24

<210> 368

<211> 19

<212> DNA

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<400> 368
ggaagtggag tggggaagg 19

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oligonucleotide

<400> 369
attcttgcca atatgcattt cact 24

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ttcttttgta ctactatta tactaa 26

<210> 371
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oligonucleotide

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aaacttgcct cttttaaaaa caat 24

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<400> 372
taccacaccc tataccttca gtca 24

<210> 373
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gagtatggca cccttttcta tcta

24

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21

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19

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22

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 caaacgaaga acatcaggga aata 24

 <210> 378
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 <210> 379
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 <400> 379
 attaccacca atattcacca taag 24

 <210> 380
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 <400> 380
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 <210> 381
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 <400> 381

gaaccccaga atgaagaaag gtaa

24

<210> 382

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<212> DNA

<213> Artificial Sequence

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24

<210> 383

<211> 19

<212> DNA

<213> Artificial Sequence

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<400> 383

acgcatggct ttggaacat

19

<210> 384

<211> 22

<212> DNA

<213> Artificial Sequence

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<400> 384

cccgtatgtg gaagggcttt at

22

<210> 385

<211> 24

<212> DNA

<213> Artificial Sequence

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<400> 385

ctaggttgat ccgggacaaa acta

24

<210> 386

<211> 22

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oligonucleotide

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aacggatgac cagggcaaat ac

22

<210> 387
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oligonucleotide

<400> 387
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22

<210> 388
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oligonucleotide

<400> 388
aagccatcat gtaaagtgaa aag

23

<210> 389
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oligonucleotide

<400> 389
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21

<210> 390
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oligonucleotide

<400> 390
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<210> 391
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<400> 391
tgagctgccca ggtgaattg 20

<210> 392
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<400> 392
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<210> 393
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<212> DNA
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oligonucleotide

<400> 393
ccagggcagc tgcaaatca gag 23

<210> 394
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<400> 394
cccgatgcga cccagttta 19

<210> 395
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oligonucleotide

<400> 395
tggaggggtt tgatgccata 20

<210> 396
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<400> 396
gatggatgcc cttcgaatac aga 23

<210> 397
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<212> DNA
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oligonucleotide

<400> 397
ttcccattta gtttgtcaat aatc 24

<210> 398
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<212> DNA
<213> Artificial Sequence

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oligonucleotide

<400> 398
aaggggagga ttgacttacc tat 23

<210> 399
<211> 21
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oligonucleotide

<400> 399

ttggcatgga cctcctcttg a

21

<210> 400

<211> 18

<212> DNA

<213> Homo sapiens

<400> 400

caagataatg atgatgag

18

<210> 401

<211> 15

<212> DNA

<213> Homo sapiens

<400> 401

caagatgatg atgag

15

<210> 402

<211> 13

<212> DNA

<213> Homo sapiens

<400> 402

tgggtgtaagg tag

13

<210> 403

<211> 13

<212> DNA

<213> Homo sapiens

<400> 403

tgggtataagg tag

13

<210> 404

<211> 17

<212> DNA

<213> Homo sapiens

<400> 404

ccccttatat ctccaac

17

<210> 405

<211> 17

<212> DNA

<213> Homo sapiens

<400> 405

ccccttatay ctccaac

17

<210> 406

<211> 15

<212> DNA

<213> Homo sapiens

<400> 406

aaatacgtaa tcgat

15

<210> 407

<211> 15

<212> DNA

<213> Homo sapiens

<400> 407

aaatacataa tcgat

15

<210> 408

<211> 15

<212> DNA

<213> Homo sapiens

<400> 408

aaatacrtaa tcgat

15